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ABSTRACT

Designed as an aid to the beginning map librarian or map custodian, this series of articles describes the basic processes of working with such a library collection. An overview of map librarianship discusses salaries, continuing education and professional associations in the field. Other articles explain procedures for selection and acquisition of materials for the map library, cataloging and classification, non-geographic methods of map arrangement and classification, preservation and maintenance of maps, systems for computer production of map catalogs, and the administration of map libraries. Each article provides citations for further reading. (SL)

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Map Librarianship

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Contents

Introduction

This issue of the *Drexel Library Quarterly* was assembled to aid the beginning map librarian or map custodian. The articles were written presupposing little prior knowledge of or experience with maps. No claim is made that this issue is map librarianship self taught, rather it should be viewed as aids for the beginning map librarian. The articles herein, supplemented by the material cited in the notes, should provide the basic minimum information needed by the new map librarian.

The reader will note two omissions which may seem rather startling. Nowhere in the issue is "map" carefully defined and a history of map making sketched. The subject is rather large and an excellent background can be found in Leo Bagrow's *History of Cartography* (Cambridge: Harvard University Press, 1964), G. R. Crone's *Maps and Their Makers* (London: Hutchinson University Library, 1968), David Greenhood's *Mapping* (Chicago: University of Chicago Press, 1964), R. A. Skelton's *Maps: A Historical Survey of Their Study and Collecting* (Chicago: University of Chicago Press, 1972), Norman Thrower's *Maps and Man* (Englewood Cliffs: Prentice-Hall, 1972), and R. V. Tooley's *Maps and Map-Makers* (New York: Crown, 1970). For the purposes of this issue, we can tentatively describe a map as a graphic representation of a planetary surface.

Also noticable by its absence is any article devoted to map reference work. All reference work can be broken down into ascertaining what the questioner really wants (the "reference interview") and knowing the collection—be it books or maps or whatever—well enough to either provide the information or refer the questioner to another source. Such knowledge can come only from actually working with a collection. To some extent, the map librarian should be like the alcoholic bartender—his or her own best customer.

In the articles that follow the authors attempt to avoid the use of jargon and try to define or explain special usages as they occur One term, "date," does seem to be used without amplification. Most, but by no means all, of the time "date" means the time period depicted on the map, not the year of issue. As an example a map showing the slave population of Virginia in 1775 would be considered a map of 1775 even though printed in 1973. Similarly, a map printed in 1973 showing the predicted population densities for 1984 would be considered a map of 1984

The reader will note that there is not complete agreement among the authors on all points This is a very normal situation and shouldn't worry anyone The authors are also rather good in presenting various minority positions in their articles There is plenty of room for controversy in the map field But whatever our disagreements and whatever term is used to define the job we do map librarian, map custodian, map curator, cartothecaire, cartologist, or cartographic archivist- you will find a strong sense of esprit and a feeling of brotherhood among those who deal with that most expressive of graphic media, the map

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Map Librarianship—Today and Tomorrow

Stanley D. Stevens

Introduction

For those beginners who are fortunate gh to be asked the question "How do you like maps?" as I ..as eight years ago, you might be given the assignment of developing a map collection, depending on your answer. If you reply with a positive answer, you might be given the response "O.K., we'll send you for a week of training, and you'll be in charge of our map collection." In a different situation the assignment might be to assume full responsibility for a collection that has been well-established for decades.

Lucky is the correct descriptor for these assignments, if you like maps. All the map librarians that I have met are quite pleased with the opportunity to work with maps. Also, considering how difficult it is to obtain a job in this specialized field, if you like the work, make the best of it!

Assuming then that you are one of the chosen few to enter this field, what are the general conditions that you might expect to find?

At least one writer on the state of map librarianship has been generally optimistic about the future. Walter Ristow stated his belief that after some setbacks in the 1950's, the profession would be lifted to "new heights of service and productivity" in the 1970's.[1] I interpret his views to mean that "personal commitment" would be high, because I don't see the trend in the direction of more support for libraries in general.

[1] Stanley D. Stevens is map librarian of the University Library, University of California at Santa Cruz.

In the decade ahead, faculty and student groups will be demanding more power over their own institutions, academic as well as economic improvement will be bargained for. Noting that America's institutions of higher learning may be marked by continuing conflict, the Carnegie Commission on Higher Education recommends that faculty members should be given the right to decide whether unionization should be adopted. Students, according to Carnegie, should be given greater voice in all campus matters.

What these demands are likely to mean for libraries is that when all the cream is siphoned off there won't be much support left to distribute in our direction. The support that does trickle down to libraries will probably benefit the traditional – and tradition has not been too kind to non-book materials. I dare say, if a formal Bill of Rights for all sectors of the academic community does emerge from these power struggles, map libraries would not have their traditional sentence of "cruel and unusual punishment" lifted.

The general erosion of the situation may be seen from another Carnegie study. It reveals that American colleges and universities have today reached a "fragile" financial situation. The Commission conducted two surveys, in 1971 and 1973, of 41 institutions representing a broad spectrum of institutional types. the 1971 survey found 29 institutions in financial difficulty which forced them to make cuts that hurt their quality. In 1973, 15 found themselves worse off than in 1971, 11 were about the same, and 15 considered themselves better off. Asked to predict trends for the next few years, none of those institutions polled saw substantial improvement in their prospects.

It was assumed by most of the public that once the Vietnam War ended there would be more money available for domestic needs, but this trend "is not necessarily inevitable even in our affluent U.S. society. Considerable promotional effort may be required to gain public acceptance of the relative needs for library projects *per se*, in comparison to other social needs."

University of California President Charles Hitch says that large-scale cuts which President Nixon proposes in education funds means "more bad news, and on a large order of magnitude." Federal and state funding cutbacks so far have sparked two major UC layoffs totaling 486 workers, as 133 other employees remain in a precarious position.

Map libraries have been able to avoid disaster by (1) reducing the rate of acquisitions, (2) postponing purchase of new equipment and supplies, (3) cancelling plans to hire additional staff, (4) stuffing more maps into overcrowded map cases, and (5) absorbing the psychological damage due to increased pressure that is a result of this erosion.

The decline in available money for map acquisitions is reflected by the UC system's percent of increase in maps added to the collections: 22% during the three-year period 1970-1973, compared to 39% for the three previous years (1967-1969). At the outset of this financial crunch the rate of acquisitions dropped to 3.25% (1970).

Support from the Institution

A poll of the attendees to the Ashland meeting of the Western Association of Map Libraries taken especially for this article helps to indicate the degree to which general support is given by the institution.* The questionnaire was distributed to the 35 persons attending who represented 26 map collections located in Arizona, British Columbia, California, Idaho, Oregon, and Washington. The collections represented are predominantly college and university, but public libraries, government agencies, and historical societies are included. The replies, therefore, represent a cross-section of types of institutions.

All of those responding indicated that they received "time off" work to attend the meeting, only 16 received some form of financial assistance to offset expenses, two received use of a vehicle only, three received air fare only, and 11 received both transportation and *per diem* (food and lodging).

Another dimension of support can be measured by the amount of time the map librarian is assigned to work on the map collection. Only 7 out of 26 responding work 100% of their time on the map collection, the balance of the 26 is spread as follows: 2 work 5%, 5 work 25%, 2 work 50%, 2 work 75%, 4 have no set amount of time assigned and must sandwich maps in with their other duties, and 5 did not respond to this question.

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*Referred to hereafter as "the poll" conducted March 29-31 at the Ashland, Oregon Meeting of the Western Association of Map Libraries, March 29-31, 1973, by the author.

Other than the principal map librarian assigned to work on the map collection, what is the number of Full Time Equivalent staff that is assigned to the map collection? 16 institutions have no additional staff, 6 have 1 FTE, 1 has 2 FTE, 1 has 3 FTE, 2 receive 3-hours of help per week, 1 receives 1/4 FTE, and 1 receives 3/4 FTE

The poll reveals that the average annual budget for acquisition of new maps is about $1,400 The number of hours open to the public is also a good indication of support 52 hours per week is the average—the range is from 13 to 94 hours

Typical Salary of the Map Librarian

What is your salary range likely to be as a map librarian? Although it is not possible, from the information I gathered, to correlate the following tabulation with years of service either as map librarian or other types of experience, we can provide a profile based on highest academic degree obtained There are, of course, many other factors that should be taken into consideration, but this should help the beginner know what to expect

Salary Range	Highest Academic Degree Obtained						
	None	BA	BLS	BS	MA	MS	MLS
$0 thru $ 5,000						1	
$6,000 thru $ 7,000	1			1			
$8,000 thru $ 9,000			1		1		8
$10,000 thru $11,000	1	1				1	3
$12,000 thru $13,000			1		1		2
$14,000 thru $15,000							2
more than $15,000							1

Personal Commitment

The poll gives an excellent indication of how dedicated to their work are those who attend these meetings The average number of miles travelled to attend the Ashland meeting was 530 The greatest was by a member who drove from Arizona The personal financial commitment was even greater for most the average out-of-pocket cost was $75 00 One member, with no institutional support of any kind, spent over $300 That's real dedication!

The member s reasons and or expectation for attending this type of meeting also says a great deal All twenty-six persons who

replied to the questionnaire indicated that they wanted to "learn some practical-theoretical information that would assist [them] in [their] work." Nearly all said they also attended to "engage in social contact among [their] colleagues." One-third indicated an interest in participating in the exchange of duplicate maps (a regular feature of the WAML meetings). Only three attended to satisfy their institution's request that they attend.

Under the economic conditions that are likely to be experienced in the coming years, there is an additional commitment that must be placed high on the agenda of every map librarian: *public relations*. Survival is not exclusively dependent on how well one does the assigned job. Unless the library administration knows what the map library is doing, it will be forgotten. It is the map librarian's responsibility to convince the administration that the map collection is contributing to the needs of the community (campus or general public)."

Continuing Education for Map Librarians

Where can I, a practicing map librarian, take courses that will help me accomplish my assigned task? Unfortunately there are no comprehensive, on-going programs that offer adequate training in the field. Occasionally there is a seminar or institute that offers limited training, such as the one held at UCLA in the summer of 1968. The Institute on Map Librarianship, 1968 was conducted by Carlos Hagen, Director of the UCLA Map Library, and sponsored by the UCLA School of Library Service under a grant from the U.S. Office of Education. This two-week program provided lectures, field trips, and practical laboratory work. Stipends of $150 each were granted to the 15 participants, plus an allowance for each dependent.

As others will point out, acquisition of maps is one of the most difficult tasks facing the map librarian. An important contribution to this field would be the establishment of a U.S. agent for current maps and related materials. There is a crying need for a well-stocked commercial vendor in the United States, like Edward Stanford Ltd., in London, and Geocenter, in Germany. With a potential sales market as large as the North American continent, it is incredible that some enterprising genius has not heretofore made the attempt at establishing such a venture. Although a great number of government agencies sell their own maps direct to the public, there are hundreds of map publishers that would use a reliable vendor. Only Telberg Book Corp. of New York,

who specializes in earth science maps (particularly those of Slavic countries), has entered the field. There are several vendors for out-of-print maps, and while I don't belittle their contribution to our work, they only fill half the need.

The cost per map from a commercial vendor would be higher than buying directly from the publisher, but availability is more important and sometimes convenience is less costly if waiting time is taken into account.

The average size of the map collections surveyed in my pool is about 67,000 map sheets. However, the range is a wide one—one collection has 300,000 sheets, another has 237,000, two collections have 150,000, thirteen collections are 50,000 and under, and six have between 51,000 and 85,000.

The University of California library system, encompassing all nine campuses, has experienced an increase of 650,000 maps during the fourteen year period since 1958. However, of the total 813,000 maps, 625,000 are located on three campuses: UCLA, Berkeley, and Santa Barbara.

Thirst for Information

Practicing map librarians have a thirst for any information concerning new ideas, sources for new maps, and news of any sort relating to the organization and administration of map collections

The Geography and Map Division of the Special Libraries Association has published its *Bulletin* since 1947, and has been the main source of information for map librarians this quarter-century It is entirely devoted to articles of interest to the map librarian.

Training for map librarians has been treated adequately by others recently, but I mention the UCLA Institute to make a point: i.e., perhaps it is appropriate at this time that we begin advocating this type of program. It is expecting too much of library science schools to devote more than one lecture on special libraries, or conduct a field trip to visit a developed map library. An alternative to the on-going course would be for the U.S. Office of Education, the American Library Association, Special Libraries Association, or individual library schools to underwrite a series of institutes

conducted by experienced map librarians, and organized and administered by the existing map library associations: Association of Canadian Map Libraries (ACML), Geography and Map Division of SLA, and the Western Association of Map Libraries (WAML).

Expansion of the Map Collection

As man's knowledge expands, so must his collection of maps. Having complete topographic coverage of all areas, and all thematic coverage of any area of emphasis, is the map librarian's constant struggle. I won't describe the *acquisitions game*, but I do wish to point out what I believe to be the appropriate philosophical attitude of the map librarian: specialized and personalized service differentiates map librarianship from other forms of librarianship. Since there are fewer patrons that use maps, compared to other printed materials, it is possible to devote more time and pay more attention to their special needs.

Locating the material is the key to this personalized service. Evaluation of the material is the responsibility of the patron. He must choose among the alternatives, but providing the alternatives and help in interpreting them is the map librarian's special province. A patient attitude, and enthusiasm for helping to solve the patron's request can help promote a good reputation for his work.

Patron demand for maps is increasing at a rapid rate, particularly in the field of environmental sciences. My own experience is that use of our map collection (all subjects) was up 134% during 1971 over the previous year. This demand has placed added burdens that require the map librarian to become familiar with all of the various publics who use maps, what type of maps they need, and how they use them. He must demonstrate his interest in serving his patrons. An expression of enthusiasm for his own work will rub off on those he serves. By suggesting how and where materials may be obtained, even though the maps are not yet in your collection, will indicate a commitment to public service—which is, after all, our *raison d'etre*. Assessment of the resources of other agencies within your community and region will place you in an excellent position to render assistance when your own collection falls short of being able to satisfy the request.

Special Libraries, the official journal of SLA, has recognized the demand for information in this field and has recently begun to

devote more of its pages to the subject. 1970 was a landmark year It published ten separate articles of direct relationship to map librarianship. However, the attention is sporadic, the 1969 volume had no articles on the subject, and the 1971 volume had only two.

The Association of Canadian Map Libraries, organized in 1967, has been devoting attention to our common objectives by publishing both a *Newsletter* as well as the *Proceedings* of its annual meeting.

The Western Association of Map Libraries, also organized in 1967, has been publishing its *Information Bulletin* and has recently begun a new monographic series, *Occasional Papers*. The *Information Bulletin* has had phenomenal growth in its young four years of publication Begun as a device to foster an exchange of information between its own membership, its circulation has extended to more than 150 members and subscribers. While this number doesn't match the readership of the other publications cited here, I wish to observe that any publication that increases its circulation every year must be absorbing some of the "thirst" of map librarians for relevant information—especially since circulation is up from the initial 20 members

Efforts to Standardize Procedures

Anyone who has studied the map librarianship literature or has attended related meetings where methods, procedures, techniques, and preferences have been described knows that there are as many variations in method as there are map collections Hardly any two collections are maintained with any uniformity

It should be noted by the novice that a collection of maps is so unique in format, organization, and storage that quite often a separate facility or semi-autonomous section is established apart from other units of the library The Library of Congress' Geography and Map Division, which is the nation's largest and richest collection, is temporarily located in a self-contained facility several miles away from the Washington library complex Acquisitions, processing, cataloging, and reference services are wholly provided by the Division itself Certain other technical processes are performed by other divisions of LC, but the specialized nature of the Geography and Map Division justifies its being set apart

This pattern can be found in several colleges and universities throughout the United States. There are varying circumstances, such as an integrated acquisitions program (for technical services only) with the main library, but it is generally true that reference work, selection of new maps for acquisition, processing, and cataloging are handled by those persons who have trained themselves to handle these tasks.

The point of this is that the uniqueness of a map collection makes standard library practices inappropriate. Furthermore, standardization of procedures that might apply to map libraries across the country are inappropriate. The attempts at standardization have not yet been successful despite well-meaning efforts. The WAML and the ACML have both instituted committees which have sought to achieve some standardization. I believe the ACML committee is still functioning, but WAML's effort died on the vine after no official pronouncement that standards could be or could not be achieved. It is my personal belief that it is an impossible task.

John Bergen cites that "the only widespread agreement on classification of maps is that it should be area-oriented."[1] Although their G schedule is area classified, the Library of Congress has decided to make the authority responsible for compilation of the map as the primary cataloging entry."[2]

Although there is a natural interest in learning about methods used by other map libraries, attempting to copy all their practices for use in your own situation is not wise. Of course there are common problems, that goes without saying, but every map library finds itself in a different set of circumstances. Some libraries serve as a reference collection for current interest, some as an archive for historical research. The latter presents unique preservation problems.

A recent presentation at the Ashland WAML meeting brought a surprising reaction. Lee Hubbard of the University of Washington described his method of folding a topographical map into a folder for convenient storage and retrieval.[3] Map librarians who are as concerned with preservation as much as they advocate heavy use of maps, didn't recall having ever heard this practice advocated before. Many in the audience were audibly shaken by this suggestion.

The map collections located on the nine UC campuses, for an example, are all of different size, begun at different times,

specialize in subjects that are of greatest importance to the purpose for which that collection exists, and are maintained by no common classification or cataloging scheme. The common problems are lack of adequate staff, space, acquisitions budget, equipment, etc. Any attempt, however, to completely standardize all operations used by these collections within the UC system would be futile and unnecessary. Some consolidation of acquisitions might be possible, but the variety of subject specialization would diminish the effectiveness of such a program.

Conclusion

Although the beginning map librarian should assume his/her task with an optimistic outlook, developments and trends require a realistic approach

The typical profile of today's map library is as follows: financial support for the map collection must compete with diminished funds for all library projects, and it is only through a well-designed public relations effort that map libraries will get their share; the average map library has 67,000 map sheets and gets about $1,400 per year for acquisitions, is open to the public 52 hours per week, and is staffed by a map librarian with practically no additional help. The typical map librarian is one who has received a Master of Library Science degree and earns between $8,000 and $10,000 per year

Although the map librarian who chooses to broaden his professional contacts by attending meetings of his colleagues will receive some support from his institution, he must expect an equal personal financial commitment. It is primarily through these meetings that the map librarian can acquire additional training. Equally important are the publications especially designed to exchange information among map librarians. Readers should not interpret this profile to mean that there is standardization throughout the field of map libraries, for there are as many variations as there are map libraries

Sisyphus was condemned by Zeus to roll a heavy rock up a steep hill forever, only to have it always roll down again when he approached the top. It was only because Zeus was angered by Sisyphus' disrespect that this reprisal occurred. In your quest for promoting your cause, I urge you to use imagination in seeking

all possible sources of support, and avoid offending unnecessarily However, the map librarian should not be willing to accept the status quo. don't let fear of reprisal prevent you from putting forward the boldest and most specific arguments to justify your request for support Be diplomatic, be committed to advancing the profession It is only through increased power that map librarianship will overcome the traditional preferential treatment afforded to book collections Participation in organizations that are designed to achieve this goal should be on the personal list of priorities for every map librarian.

The next few years do not portend easy times for the map librarian and the development of the map collection, but personal commitment to long-range goals, coupled with a lot of public relations, will make the trend turn around

Notes

1 Walter W Ristow Emergence of Maps in Libraries *Special Libraries* 58 No 6 (July August 1967) 401

2 Carnegie Commission on Higher Education *Governance of Higher Education Six Priority Problems* (New York McGraw-Hill 1973)

3 Carnegie Commission on Higher Education *The New Depression in Higher Education Two Years Later* (New York McGraw Hill 1973)

4 Jack McCormick After Viet What? *Special Libraries* 60 Nos 7 8 (July August 1969) 328

5 *Unific* March 1973 p 1 (Published for University of California Staff Laboratory and Academic Employees)

6 For some ideas on how to interest users in the map collection see Marian D Euler Introducing Librarians and Students to Maps *Bulletin*, Special Libraries Association, Geography and Map Division No 87 (March 1972) 46 47

7 John V Bergen Geographers, Maps, and Campus Map Collections *The Professional Geographer* 24 No 4 (November 1972) 311 See also Bill M Woods "A Continuing Need Education for Map Librarianship *Bulletin*, Special Libraries Association Geography and Map Division No 81 (September 1970) 28-29

8 Gary W. Rees and Mary Hoeber. *A Catalogue of Sanborn Atlases at California State University, Northridge*. Occasional Paper No. 1 (Santa Cruz: Western Association of Map Libraries, 1973). (Available from the author of this article.)

9 Bergen. *op. cit.*, p. 312.

10 Walter W. Ristow and David K. Carrington. "Machine-Readable Map Cataloging in the Library of Congress." *Special Libraries* 62, No. 9 (September 1971): 345-346.

11 Lee Hubbard. "Making Maps Fit for Regional Service." *Western Association of Map Libraries Information Bulletin* 4, No. 3 (June 1973): 41-43.

Selection and Acquisition of Materials For the Map Library

David A. Cobb

This article is intended for the librarian with little experience in map libraries. In other words, it is aimed at the librarian who has just been told to take over an existing collection or to the one who has been told to establish a map collection. Initially, I will suggest what I consider to be general basic materials which should be collected by all map libraries, from the general world atlases to local maps. Throughout the text sources for the acquisition and selection of maps, atlases, globes, aerial photographs, wall maps, and related materials will be introduced.

The need for an active and planned acquisitions program, whether it is simply updating a very small collection or developing a research collection, is important for the library and its users. In order to establish an acquisitions policy, the librarian must first recognize the limitations of his library, size of library, type of library (academic or public), space available, and expected financial support. A recent article by Alberta Koerner will assist the new map librarian in the initial phases of library organization.

The size of the library will have a great deal to do with the future development of the map collection. Is it to remain a general up-to-date reference collection or is it to become a major library collection? I believe the librarian assigned to an existing collection, regardless of type or size, faces a more difficult dilemma, since he must first discover what is there before beginning an acquisitions program. The following pages will

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include a list of basic sources the author feels should be in most map collections

World Atlases

The need for current world reference atlases is obvious. However, there seems to be an overemphasis of these general atlases when the acquisition of other related sources (thematic atlases, national atlases, maps, gazetteers, and bibliographies) could improve the library's reference services. The following world atlases would constitute an excellent basic collection: *Times Atlas of the World* (London: Times, 1972); *The International Atlas* (Chicago: Rand McNally, 1969); *Commercial Atlas and Marketing Guide* (Chicago: Rand McNally, annual editions); and the *Oxford Economic Atlas of the World* (London: Oxford, 1972). Two recent atlases which may be helpful are the new *Oxford World Atlas* (London, Oxford, 1973) and the *Times Concise Atlas of the World* (London, Times, 1972). The *Times* comprehensive edition is the latest issue in a fine tradition of world atlases with many large-scaled maps and a 200,000 place name gazetteer section. *The International Atlas* is perhaps the best effort of any U.S. commercial publisher. Its use of shaded relief maps makes the atlas easier to read for those users unfamiliar with map interpretation. Two excellent economic atlases are the *Commercial Atlas and Marketing Guide* and the *Oxford Economic Atlas of the World*. The first, used in most American libraries, is published annually giving statistics on agriculture, communications, manufacturing, trade, transportation, and population for small geographical areas in the United States. The Oxford atlas will be essential for world economic data in graphic form.

Historical Atlases

To accompany these world atlases which reveal current information, every library should have historical atlases as well. *Shepherd's Historical Atlas* (New York, Barnes and Noble, 1967) and *The New Cambridge Modern History, Vol XIV, Atlas* (London: Cambridge University Press, 1970) are two of the best historical atlases. Each of these may have their advocates, although the Cambridge may be preferred since it is the most recent, contains more maps, and does include information from the late sixties.

Two atlases dealing specifically with American history may also be of interest to many libraries. Theodore Miller's *Graphic*

History of the Americas (New York: Wiley, 1969) and American Heritage's *The American Heritage Pictorial Atlas of United States History* (New York: American Heritage, 1966).

United States Atlases

The *National Atlas of the United States* (Washington: U.S. Geological Survey, 1970) must be included in every library with a map collection. It is the most complete atlas ever published for the United States and will answer questions from land use to traffic flow. Examples of the major subjects covered are: General Reference Maps, Physical, Historical, Economic, Socio-Cultural, Administrative, and World Maps.

Another excellent atlas for the map library, and still only $2.95, is the *Rand McNally Road Atlas* (Chicago: Rand McNally, annual editions) which will be used by vacationers and campers. This atlas provides up-to-date road and mileage maps of every state and lists of national forests and parks.

World Maps

Although atlases are very useful tools, it is the map that the librarian must turn to when a patron requests more detail than that shown in an atlas. An atlas, because of its size and format, is restricted in the detail it can show. The following sets of maps are suggested for the library to choose from, depending upon the scope of its collection: "International Map of the World" (IMW), "Operational Navigation Charts" (ONC); and the 1:2,500,000 "World Map." Although many of the IMW sheets are out-of-date, especially those sheets covering the Americas, it can be a convenient reference for those regions with up-to-date coverage. These maps, excluding the Americas, may be purchased from the U.S. Defense Mapping Agency's Topographic Center in Washington; those for the Americas are available from the American Geographical Society in New York. Another more recent set of maps, consisting of only 244 sheets (versus over 1,000 for the IMW), and published by the Hungarian Department of Cartography, provide an accurate and current coverage of the world at the scale of 1:2,500,000. Still another choice for the map library is the Operational Navigation Charts (ONC), published by the Defense Mapping Agency's Aerospace Center. These charts, produced in St. Louis, are exceptional world reference maps at the scale of 1:1,000,000 with shaded relief. Education institutions may receive fifty *free* copies of these maps each year.

For those libraries intending to develop a research collection, they should be a depository for the Defense Mapping Agency's Topographic Center (formerly the Army Map Service and Army Topographic Command). If necessary, they should place their name on the waiting list for new depositories. Although their maps are often quite dated, they do provide a general basic collection to build upon.

United States Maps

Any map collection of the United States must begin with the U.S. Geological Survey's topographic quadrangles. Free indexes showing current coverage of the individual states are available from the U.S.G.S. in Washington. Their maps are also available on depository and the U.S.G.S. Map Information Office has numerous free brochures describing the various types of maps published by the Survey. I would encourage every map librarian to investigate all of the series offered by the U.S.G.S. Topographic maps of Alaska and Antarctica, 1:250,000 and 1:1,000,000 topographic maps of the United States, "Miscellaneous Geologic Investigations," "Hydrologic Investigations Atlases," and the "Geologic Quadrangle Maps" are series which should be in every medium to large map library and are not automatically included in all depositories.

For those libraries interested in coastal charts of the United States, a depository with the U.S. National Ocean Survey in Washington can usually be arranged. These detailed nautical charts, well over 1,000 in number and quite large in size, would probably be of use to only the larger map libraries. Another set of charts is available from the National Ocean Survey's Lake Center; these are the lake charts of the Great Lakes, Lake Champlain, the St. Lawrence River, and the New York State Barge Canal System.

With the continuing emphasis on outdoor recreational activities, the U.S. Forest Service maps of the national forests would be useful items in the map collection or library. These maps can usually be obtained free of charge from the various Forest Service field offices.

The U.S. Bureau of the Census publishes an exceptional series of thematic maps of the United States exhibiting a variety of population and economic characteristics by counties. This "GE-50 Series" is available from the U.S. Superintendent of Documents.

Local Materials

Local materials (city plans, zoning maps, state maps, etc.) will encompass the geographical area in which all libraries should be most interested. Initially, this material may prove to be the most difficult to obtain since, beyond the annual state highway map or local Chamber of Commerce city map, state and local maps are very seldom advertised. A lively correspondence file is the only way to discover these materials.

A visit or telephone call to the local city engineer's office, and similar county offices, will ordinarily result in numerous detailed maps of your community offered to your library at a very nominal cost. A review of your state's government organization manual will furnish you with the names and addresses of state agencies which may be involved in mapping. Among the obvious agencies to be contacted are the Highway Department, Geological Survey, Forestry Department, Parks Department, and a variety of state planning offices. The Highway Department is perhaps the most important since they produce hundreds of maps annually. Eliminating the detailed engineering drawings which few libraries need, they normally produce city plans for most towns and cities throughout the state, as well as county outline and transportation maps. These have always been provided to our library free of charge.

Other items to be included with local acquisitions are state, county, and city atlases. There have been numerous state atlases published, and many states have county plat books produced by commercial publishers, showing land ownership.

Historical Maps and Atlases

Each library should have a small collection of historical maps of its state, even if it has to be a facsimile collection. As Ristow indicates, there are numerous dealers in facsimile maps and atlases, and the list and offerings continue to grow.[7]

For those libraries fortunate enough to be able to purchase original editions, or for the library wanting to have a few select historical maps of their region, the more common dealers are Argosy Book Stores, H. P. Kraus and L. S. Straight, all of New York, and Kenneth Nebenzahl of Chicago. Many others in the United States as well as those in foreign countries will be found in an article by R. W. Stephenson in *Special Libraries*.[8]

Sources for Future Acquisitions

After having made the basic selections, how does the map librarian keep his collection current? How does he acquire new materials? The most common source for current acquisitions are the professional journals. There are numerous publications which occasionally review or announce new maps and atlases, however, the following journals contain lists and/or reviews of maps and atlases in each issue. *Bulletin of the Society of University Cartographers, The Canadian Cartographer, The Cartographic Journal, Military Engineer*, SLA Geography and Map Division *Bulletin, Surveying and Mapping*, and the Western Association of Map Libraries *Information Bulletin*. These journals will be satisfactory for the majority of libraries although there will be a few which need to know of new maps even sooner. These libraries need to investigate the use of acquisitions lists produced by their colleagues in other map libraries. The following libraries produce accessions lists at regular intervals.

1 University of British Columbia
Library
Map Division
Vancouver 8, B.C., Canada

2 University of Calgary Library
Map Collection
Calgary, Alberta, Canada

3 University of Georgia Library
Map Collection
Science Library
Athens, Georgia 30601

4 Map and Geography Library
University of Illinois
Urbana, Illinois 61801

5 Map Library
Illinois State University Library
Normal, Illinois 61761

6 Geography and Map Library
Department of Geography
Indiana University
Bloomington, Indiana 47401

7 Map Library
Kenneth Spencer Research
Library
University of Kansas
Lawrence, Kansas 66044

8 La Cartotheque
Bibliotheque Generale
Universite Laval
Quebec 103, Quebec, Canada

9 Map Division
University of Minnesota
Library
Minneapolis, Minnesota 55455

10 Map Library
North Illinois University
Library
DeKalb, Illinois 60115

11 Departmental Map Library
Department of Energy,
Mines and Resources
615 Booth Street
Ottawa, Canada K1A 0E9

12 Oxford University
Bodelian Library
Map Section
Oxford, England

13 Map Library
Rand McNally and Company
Chicago, Illinois 60680

14 Map Library, Rm. 617
University of Toronto
100 St. George St.
Toronto 5, Ontario, Canada

15 American Geographical Society
Broadway at 156th Street
New York, New York 10032

16 Distribution Section
U S Geological Survey
1200 South Eads Street
Arlington, Virginia 22202

All of the above libraries, except for the American Geographical Society, distribute their lists free of charge I have chosen to emphasize this aspect of acquisitions because I believe these lists provide excellent citations to current map production of interest to both major and minor map collections They also allow you to compare your acquisitions program and collection with others throughout the country

Beyond the journals cited previously, there are numerous publications which include reviews occasionally. Those most familiar to the librarian should be *Choice*, *RQ*, and the *Wilson Library Bulletin* Among the many geographical journals listing and or reviewing maps and atlases infrequently are: *The Geographical Review*, *The Journal of Geography*, and *The Professional Geographer* As with most reference collections, the librarian must depend upon his knowledge of the library's patrons and anticipate their needs As a rule, the librarian must order without the benefit of reviews simply because it may be at least six months to a year before they begin to appear

No library, no matter how large, can hope to have all the books published and neither can a library hope to acquire the many thousands of maps published annually Two commercial map vendors which attempt to meet the needs of all map libraries are Edward Stanford Ltd of London and the Geo Center International Map Center of Stuttgart, Germany (formerly two companies Zumstein Map House and Reise-und Verkehrsverlag). These two vendors have published large two-volume loose-leaf catalogs complete with index maps They also issue regular supplements Although it may be convenient to patronize one large vendor, dealing directly with the original publisher will frequently save both time and money Therefore, all libraries should make an attempt to acquire catalogs from as many countries and publishers as possible The value of such a catalog collection in the words of Carlos Hagen, is that

> it enables faculty and students to immediately determine whether the materials they want are published, and if so their prices, technical characteristics, and the area they cover The library, in turn, can immediately prepare acquisition orders for any area without having to write first for catalogs and price lists

The most complete list of map publishers with addresses was recently revised and is available from the Departmental Map Library, Department of Energy, Mines, and Resources in Ottawa. Their publication, *List of Map Scurces*, 3d ed., 1972, contains over 460 references listed by country.

Wall Maps

If a librarian is associated with a departmental or school collection, he will have to become acquainted with wall maps which may be needed for teaching purposes. The major sources for these maps are the American Map Company of New York, Denoyer-Geppert Co., A. J. Nystrom, and Rand McNally and Co of Chicago. These companies produce comprehensive catalogs which would be desirable for all libraries to have for consultation American Map, Denoyer-Geppert, and Nystrom are agents for foreign maps as well.

Globes

While a recent article described globes as " little more than decorative touches in map libraries,"[1] I believe librarians could exploit this reference tool to a greater extent and certainly ought to be aware of the sources and prices of globes. Otness' article is a useful overview of the features, types, sizes, prices, and sources of globes. The major sources, according to Otness, are Denoyer-Geppert, Modern School Supply, Rand McNally and Co., Hammond Inc., A. J. Nystrom and Co., and Replogle Globes. Whether decorative or not, a globe will provide an easy-access general reference tool for the library's users.

Aerial Photography

Surprising as it may seem, stereoscopic vertical aerial photography at the scale of 1:40,000 or larger covers all of the United States and is more recent and complete than the U.S.G.S. large-scale topographic map coverage.[2] Although the U.S. Department of Agriculture is responsible for most of the aerial photography in the U.S., an initial request for photographs should be addressed to the Map Information Office, United States Geological Survey, Washington, D.C. Other information such as addresses, indexes, information on foreign photography, and space photography can be found in *Sources of Information and Materials. Maps and Aerial Photographs* published by the Association of American Geographers.[3]

Two index maps of interest to those libraries using aerial photography and available free of charge from the U.S. Geological Survey are. *Status of Aerial Photography in the United States* and *Status of Aerial Mosaics in the United States*. These maps show the agencies responsible for the photography of specific areas throughout the United States

Reference Books

Each librarian should be interested in a collection of related books which will assist his reference service in the map library. These related sources would include bibliographies, gazetteers, directories, and special dictionaries. Although discussion of these particular sources is beyond the scope of this introductory article, there are specific volumes the librarian should be acquainted with. Even though most map librarians are not involved with a special geography collection as well, Lethwaite's *Revision of a Basic Geographical Library, A Selected and Annotated Book List for American Colleges* (Washington: Association of American Geographers, 1970) would be useful to augment the general bibliographies by Walford and Winchell. Cheney's recent *Fundamental Reference Sources* (Chicago: American Library Association, 1971) includes a chapter on geographical information which would be an excellent survey for the novice map librarian to peruse. Another recent reference book, especially useful to the library's patrons, is S. P. Walsh's *General World Atlases in Print, A Comparative Analysis* (New York: Bowker, 1973). A general overview of the evolution of modern mapping, a discussion of major atlases and maps of the world, as well as a chapter on map librarianship is provided by Lock's *Modern Maps and Atlases* (Hamden, Conn.: Archon Books, 1969). This book is strongly recommended because of its value as an acquisitions and bibliographical reference

Two directories of map collections which each map library should have are SLA's *Map Collections in the United States and Canada* (New York: Special Libraries Association, 1970), and the Association of Canadian Map Libraries *Directory of Canadian Map Collections* (Montreal: ACML, 1969). These are valuable for addresses of colleagues and map collections, and both provide general descriptions of the libraries included.

Information and citations to general bibliographies, carto-bibliographies, gazetteers, subject dictionaries, and other

directories and reference sources will be found through a general search of the literature

Conclusion

This article has attempted to be a practical guide to beginning map librarians by suggesting a basic list of materials and providing sources which will assist them in the selection and acquisition of future materials. The sources presented in this article represent a selective map library reference collection and were chosen since they are the items used most often by the author during his experience as a map librarian. It is intended as a *basic* list, a starting point if you will, from which the individual library may expand in those areas of particular interest to its users.

Finally, in this period of budget restraints, I would urge map librarians not to hesitate to request complimentary copies from all conceivable types of publishers. Many state, federal, and even foreign map publishers are very cooperative and willing to provide single copies of selected publications free of charge. You will soon discover those publishers who will not send complimentary copies and encounter further sources of maps as your experience in map librarianship increases.

Notes

1 Alberta G. Kraemer, "Acquisition Philosophy and Cataloging Priorities for University Map Libraries," *Special Libraries*, 63 (November 1972): 511-16.

2 For more information see: Maurice E. McGaugh, "Geographies, Atlases and Special References on the States and Provinces of Anglo-America: a Bibliography," Special Libraries Association, Geography and Map Division, *Bulletin*, Nos. 83, 84, 85 (March, June and September 1971). Richard W. Stephenson and Mary Gaineder, "Anglo-American State and Provincial Thematic Atlases: a Survey and Bibliography," *Canadian Cartographer*, 6 (June 1969): 15-45.

3 Walter W. Ristow, *Facsimiles of Rare Historical Maps Available for Sale: a List of Reproductions for Sale by Various Publishers and Distributors*, 3rd ed., rev. and enl. (Washington: Library of Congress, 1968) January 1971 supplement inserted.

4 Richard W. Stephenson, "Published Sources of Information About Maps and Atlases," *Special Libraries*, 61 (February 1970): 87-98, 110-2.

5 Carlos B. Hagen, "The Establishment of a University Map Library," Western Association of Map Libraries *Information Bulletin*, 3 (October 1971): 2-15.

6 Harold Otness, "Globes: Current Offerings," Western Association of Map Libraries *Information Bulletin*, 4 (March 1973): 5-9.

7 Association of American Geographers. High School Geography Project. Committee on Maps and Aerial Photographs. *Sources of Information and Materials: Maps and Aerial Photographs* (Washington: Association of American Geographers, 1970), p. 141.

8 Ibid.

9 An example of a list for a particular geographic area was presented by the author earlier in "Developing a Small Geographical Library with Special Emphasis on Indiana," *Focus on Indiana Libraries*, 26 (Fall 1972): 114-120.

Map Cataloging—An Introduction

Gail N. Neddermeyer

The subject of map cataloging has been discussed at great length for many years. Any sizable collection of maps should be cataloged in some way for many of the same reasons that books are cataloged. A catalog of a map collection is particularly useful since maps are physically difficult to store and handle. Maps, because of their physical format, deteriorate more rapidly than books; consequently, and this is a particularly important point, a catalog that can provide sufficient information about the maps in a collection will aid in preservation by reducing unnecessary physical handling.

The type of cataloging most appropriate for maps has been the subject of considerable controversy. Bill M. Woods' article, "Map Cataloging: Inventory and Prospect," provides an excellent history of the dispute even though his discussion quite clearly favors one type of map cataloging.[1] Basically the controversy is concerned with the choice of the responsible authority or the geographic area as the main entry. Those opting for the responsible authority favor the traditional descriptive cataloging outlined in the *Anglo-American Cataloging Rules*,[2] while those preferring the geographic area as the main entry propose any of a number of variant cataloging systems designed specifically for maps. Both cataloging systems have merits depending upon the situation in which they are to be used. There is no absolutely best system that all should adopt.

For many map collections the exact bibliographic identification and physical description of a map is not the primary need. Rather the patron wants to know if the collection contains a map of a

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particular area with certain characteristics, such as subject, date, or scale. The patron usually does not care who made the map. For these reasons the use of the *Anglo-American Cataloging Rules* for maps is probably not the most ideal method of cataloging maps for most map collections.

In addition to the above mentioned basic considerations, a number of other factors mitigate against the use of the *Anglo-American Cataloging Rules* for maps. Since the Geography and Map Division of the Library of Congress is not presently publishing cataloging copy for maps (other than on MARC tapes), choosing this cataloging system means that much time must be spent producing detailed original descriptive cataloging, including establishing main entries through time-consuming bibliographic searching of the National Union catalogs and other bibliographic sources. The determination of the authority for a map, particularly foreign corporate authors, is not always a simple task. To create a good card catalog, the author entry must be carefully and consistently chosen. This type of cataloging cannot be done by inexperienced student or library assistants on whom most map libraries must depend for the majority of their staffing.

Another factor to consider is the usefulness of the author file for maps. For many map libraries, the amount of time that must be devoted to establishing author entries and typing cards may far outweigh the utility of the file. The main author entry, once established, does not provide the most needed access to the maps—that is by area and subject; this access must be provided by additional subject cataloging and more catalog cards.

On the other hand, there are some definite advantages to be gained by using the *Anglo-American Cataloging Rules*. First, library patrons are familiar with this form of cataloging, and the *Anglo-American Cataloging Rules* are widely used. Detailed bibliographic reference sources do exist, and if they are easily accessible, they can be utilized effectively. For many maps, particularly older series, Library of Congress catalog copy is available. Records in this format are compatible with other library catalog cards and can be interfiled into a union or general card catalog if it is deemed desirable. If the map collection is very small, it may be more useful to file map catalog cards with those for books. For some map libraries, particularly those with collections of old or rare maps, where questions refer to specific editions or particular maps, the Library of Congress cataloging

provides the standard bibliographic approach and may be the best choice. Another factor to consider is who does the cataloging; if the map cataloging is done by a central cataloging department, rather than by the map collection staff, using the *Anglo-American Cataloging Rules* may result in simpler procedures and more uniformity, since the catalogers would not need to be familiar with entirely different cataloging procedures for books and maps.

As an alternative to the traditional descriptive cataloging of the *Anglo-American Cataloging Rules*, many map librarians have developed schemes designed specifically for maps. These systems are based on the assumption that the area, subject, date and scale are of primary importance, rather than the authority. For most map libraries one of these methods is probably more desirable than using the *Anglo-American Cataloging Rules*. Since most map reference questions concern maps of a certain area, this method of cataloging creates a main entry card that answers that question. Multiple cards are not necessary unless additional areas or subjects, or the author or series, need to be traced. Area/subject cataloging brings all maps on a particular subject of an area together in one place and thus makes searching the card catalog very simple. Area/subject cataloging is much simpler to generate than author main entry cataloging. By using existing lists of areas and subjects, the cataloging can be performed by relatively unskilled student or library assistants.

Area/subject cataloging does have disadvantages. There is no subject/area approach unless this is provided by additional cataloging and card production. An area/subject catalog is generally not compatible with other library catalogs and must be maintained as a separate file. Standard bibliographic searching is not possible. All cataloging, even though simple, must be original, because no current reference works, such as the Library of Congress catalogs, are published.

The several samples of area/subject cataloging illustrate the variety of information that may be recorded for a map. It is important to note the placement of the various elements.

Boggs and Lewis define the date as the third most important element.[3] (see Fig. A) while the Special Libraries Association, Geography and Map Division's Committee on Map Cataloging defines the main entry as area—date—subject—scale—size.[4] (See Fig. B.) By placing the date before the subject, maps on a

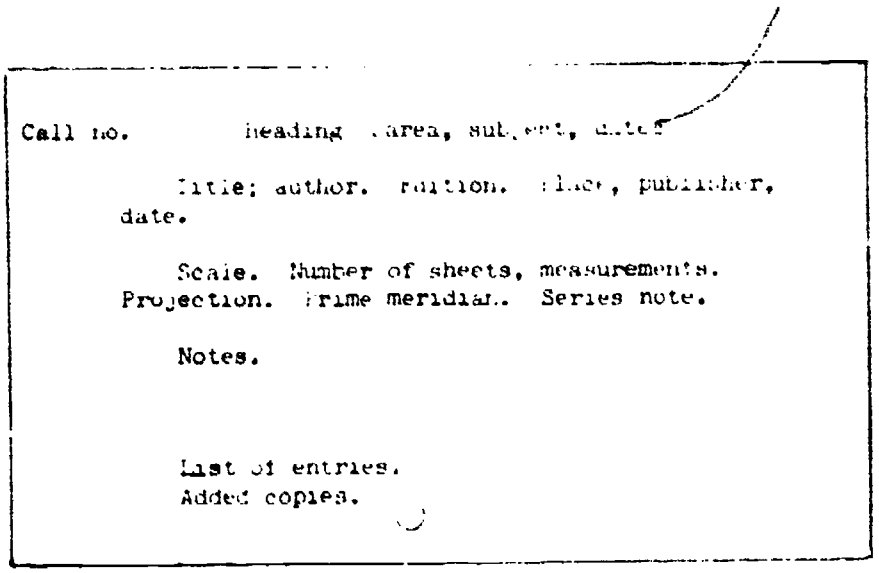

Figure A Boggs and Lewis

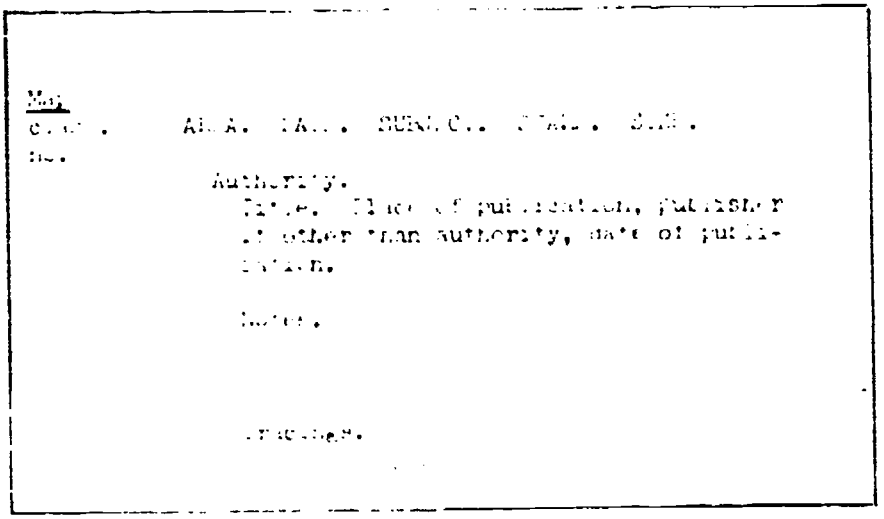

Figure B SLA Geography and Map Division. Committee on Map Cataloging

particular subject do not necessarily file together Instead, they will be separated into chronological sequences For many collections this would be a distinct disadvantage If on the other hand, the map collection consists of large numbers of maps on the same subject and area, and the date of the map is of prime importance, this cataloging system may have desired advantages

The rules of the American Geographical Society of New York provide for map cataloging by area and date. (See Fig. C) Subject

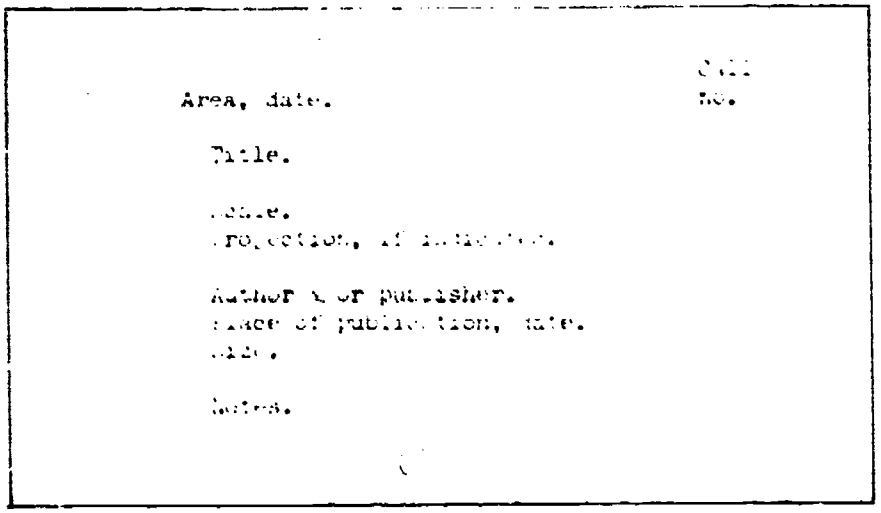

Figure C American Geographical Society

access is provided by subject cataloging and by a code in the call number. This system, like the *Anglo-American Cataloging Rules*, requires the production of a number of catalog cards for each map. On the other hand, no author card is generated, and the cataloging does provide dual access to the collection, first, by area and date, and second, by subject, area and date.

Many map libraries have adopted *form cards* for cataloging map collections. Some examples have been included for comparison. (See Figures D & E.) Form cards are understandable to virtually all

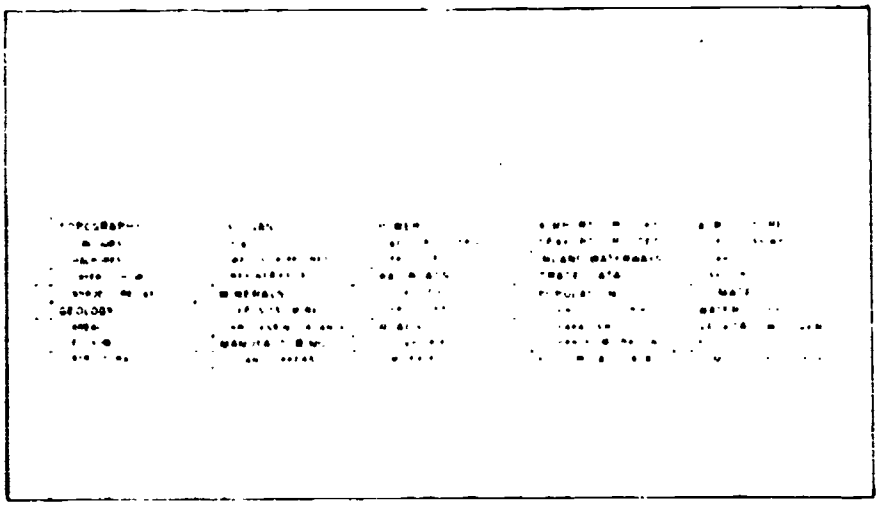

Figure D University of Kansas

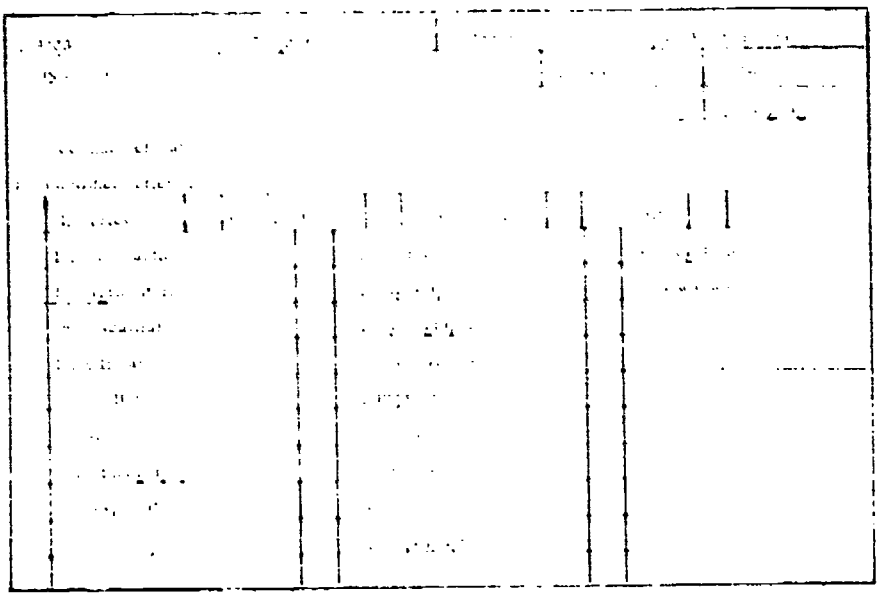

Figure E Army Map Service

library users In a map collection staffed primarily by the general reference or other non-map personnel who are not familiar with map cataloging procedures the form card is easy to read A form card also allows for considerable self-service of the collection The fixed format assures uniformity in card typing Cataloging using form cards is simple These cards, however, do have the definite disadvantage of limiting the amount of usable space on the card, but additional blank cards can be used for extended notes Form cards are not compatible with other library catalog cards, and thus cannot be interfiled And finally, form cards must be reproduced either within the library or by an outside source obviously this is a cost factor to be considered

Maps in series present additional problems The basic cataloging of a series is similar to that of a single map, but a decision must be made on what kind of records to keep for the individual sheets of the series Map sheets can be listed serially by name or number on catalog cards, or they can be analyzed individually Obviously both methods are very time consuming and for most map libraries probably unnecessary

Index maps provide the most useful access to series maps, and an annotated index map (coloring or marking the squares for maps in the collection) is an efficient way to record holdings Maps for which there are no printed indexes will have to have indexes

made or, although less desirable, holdings will have to be listed by sheet name or number

There are several ways to store indexes to maps. The Library of Congress puts each map in a letter-size manila folder and files them in call number order in filing cabinets. For indexes of varying sizes this is a convenient way of storing them. It does, however, limit rapid scanning of the indexes. Another method for handling indexes is to place them in the map case with the map sheets. Here again, scanning of many indexes is difficult.

By mounting indexes on a standardized sheet or folding them to that size, they can be punched and filed in call number order in binders covering all or certain parts of the classification. Sheets about the size of the A M S index maps are convenient, particularly in libraries that have large A M S. map collections. The U S. Geological Survey indexes are, however, difficult to accommodate by such folding, and indexes for heavily used states may be best filed separately with a reference under the appropriate call number in the binder.

When cataloging maps by any scheme it is necessary to establish *authority lists* for area and subject headings. Area handings are a constant problem in map library cataloging. Unless one has a staff large enough to constantly recatalog maps as the names of countries change, a series of "see" and "see also" references or history cards must be used. Consistency of some kind is absolutely essential, particularly when the main entry for a map is an area.

One can use the map card catalog as an authority file and make decisions on new entries as they are needed. Using the Library of Congress catalogs is another method of determining main entry areas for cataloging. Another list, however, the "Area entries" in the American Geographical Society's *Cataloging and Filing Rules for Maps and Atlases in the Society's Collection* can be used. This publication is updated periodically, but nevertheless additions will have to be made. However, this list does bring together in one list most of the basic area headings and provides the initial "see" and "see also" references that are needed in the card catalog. For political subdivisions and cities a comprehensive gazetteer will be needed since the American Geographical Society list does not include these.

When using an area main entry, a decision must be made as to what kinds of areas will be used. Following the Library of Congress

practice each jurisdiction becomes its own entry Thus RIVERSIDE, CALIF is a main entry as is each island, river, county or state

Other methods of defining areas involve the establishment of a heirarchy of jurisdictions. One can enter cities, counties and other areas of a state under the name of the state By using these rules Riverside, California would be cataloged as CALIFORNIA--RIVERSIDE Another modification of the heirarchy system is used by the American Geographical Society, they use the form headings of "cities" and "section" to subdivide a jurisdiction. The specific city then becomes a subdivision of the form heading "cities" Again, Riverside, California becomes CALIFORNIA--CITIES RIVERSIDE This method of cataloging brings all maps of a certain kind of jurisdiction together under one heading

There are numerous lists of subject headings which can be used for maps, some have been specifically designed for maps and others designed for general cataloging use The Library of Congress subject headings are extremely detailed and cover all areas of knowledge Unless the map collection is very large, the subjects and subheadings provided for in the list will probably be unnecessary The American Geographical Society list of subject headings is an example of one developed primarily for maps and geographical works It is much more concise, and in many ways easier to use than the Library of Congress list Boggs and Lewis' list of subject headings may also be useful but it is rather dated and may need considerable revision

When examining map cataloging systems and choosing one to use in a particular situation, a number of factors must be considered Who uses the collection? How do they use it? How much is it used? In addition to these patron considerations, staffing, facilities, and budget must be studied Both the level and the number of employees will be a determining factor in what can be done with the collection Any of the schemes will probably have to be examined and modified to conform to the particular situation

Notes

1 Bill M. Woods, "Map Cataloging: Inventory and Prospect," *Library Resources and Technical Services* 3 (Fall 1959): 257-73.

2 American Library Association, et al., *Anglo American Cataloging Rules* (Chicago: American Library Association, 1967), pp. 272-81.

3 Samuel W. Boggs and Dorothy Cornwell Lewis, *The Classification and Cataloging of Maps and Atlases* (New York: Special Libraries Association, 1945), pp. 26-61.

4 Special Libraries Association, Geography and Map Division, Committee on Map Cataloging, "Final Report," *Bulletin* 13 (October 1953): 19-24.

5 Roman Drazniowsky, *Cataloging and Filing Rules for Maps and Atlases in the Society's Collection*, rev. ed. (New York: American Geographical Society, 1969), pp. 2-34.

6 Ibid., pp. 35-61.

7 U.S. Library of Congress, *Subject Headings Used in the Dictionary Catalogs of the Library of Congress*, 7th ed. (Washington: U.S. Library of Congress, 1966).

8 Boggs and Lewis, pp. 21-25.

9 Ibid., pp. 14-20.

Map Classification*

Mary Larsgaard

Perhaps the first step in classifying a map collection is to ask yourself why it needs to be done. The most obvious reason for classifying any set of objects, including maps, is that by systematically arranging the objects in categories according to subject or form the objects may be easily retrieved and used.[1]

Although map classification may seem a somewhat esoteric subject, at least to those who are not map librarians, the enterprising searcher for map classification schemes can find a goodly number from which to choose. Map classification may be by area, subject, size, date, or acquisition number. Area classification seems by far the most sensible, as it is by area that patrons most frequently request maps;[2] comparative study is definitely facilitated—indeed made possible—by filing maps of the same area together. Subject classification is utilized when all road maps are filed together, or when all topographic series are filed in one area. But in the main, "few questions are asked in which a detached geographic feature or subject such as navigation, rivers, or mountains is concerned, without reference to the geographic or political area of which such areas are a part."[3] Arrangements of maps by size, date, and acquisition number, in that order, is argued for by Mlle. Foncin of the Bibliotheque Nationale of France. She feels that it is not possible to file together sufficient maps of like area and subject to justify the time and cost of classification, and that it is far better to put the effort into detailed cataloging.[4] This is in direct disagreement

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*This is a revised and expanded article of the original appearing in *Western Association of Map Libraries Information Bulletin* 4, No. 1, (November 1972)

with Mr Lloyd Brown's belief that area classification is simple to arrange, and applicable to the largest collections without difficulty.[3] Retrieval is achieved in Mlle Foncin's system by consulting the detailed catalog and presumably by opening many drawers in many different places. The system does indeed economize on storage, space, time, and money.[4] It would seem, however, that money gained by the economical filing system is lost in the amount of time it takes to retrieve maps. Moreover, Mlle. Foncin's basic premise is faulty. Indeed, a large portion of maps for any given area and subject can be notated in such a way that they will be filed together.

After deciding whether to classify by area, subject, or size, one must decide what form of notation will be used: 1) natural language, 2) numeric, or 3) alphanumeric.

Natural Language Classification

One of the main virtues of natural language classification systems, usually called titling, is that they are very quickly comprehend by the patron.

As used at the main library at the University of Washington, titling is gradually replacing U.S. Library of Congress class numbers. Mr. Lee Hubbard, map librarian, uses a system whereby titling is placed in the bottom right hand corner of the map's margin.

INDIA	Geographical area
1:500,000	Scale if the map is part of a series
SOILS	Subject
1968	Date

The maps are filed by continent or convenient physical area, and within these areas alphabetically by political unit. Subjects are selected from a list of nineteen which are abbreviated, i.e., Geol for Geology, Pop for Population, etc.[5]

The U.S. Geological Survey Library in Washington, D.C., also uses titling; in the lower right hand corner of each map is a natural language code.

France. Gravity. 1:320,000	Area. Subject. Scale
sheet 221, 1972	Sheet no. (if part of series). Date

Although the USGS library does not classify its maps by a numerical system, the maps are filed in drawers which are

arranged according to the geographic numbering scheme used to classify books in the library.[9]

Numeric Systems

No totally numeric classification systems have appeared. Two that come close are the Dewey Decimal system, and the system used by the U.S. Geological Survey Library at Menlo Park, California. Both of these systems indicate area and subject by number, and author by cutter. The following is a summary of the USGS (Menlo) notation system:[10]

000	Oceans	**000**	General works
100	Canada	**100**	Mineralogy
200	United States	**200**	General geology
300	Mexico	**300**	Historical geology
400	South America	**400**	Economic geology
500	Europe	**500**	Physiography
600	Asia	**600**	Paleontology
700	Africa	**700**	Mathematics, surveying
800	Australia	**800**	Physics and chemistry
900	Oceania Polar regions	**900**	Biology, natural history
990	Antarctica		

The form for a call number is

M(200)2	Prefix "M" used for all maps, (area number) subject number
Un3gq	Author cutter, first significant letters of title

In the seventeenth edition of DD (the most recent edition that I could locate in a library which classifies by LC), maps are given class number 912, and termed, "Graphic representations of the earth's surface." 912.1001-912.1899 (divide like 001-899) is for specific subjects, 912.19 for regions (divide like area notation) and 912.3-912.9 for specific continents, countries and localities.[12] In the latter case, area notations from the area table, which removes geographic detail from the general history schedule, 930-990, and places it in a special table, are added onto 912.[13] The area table is a list of numbers relating to geographical areas, and has the following general pattern:[14]

-3	Ancient world	**-7**	North America
-4	Europe	**-73**	United States
-5	Asia	**-74 to -79**	Specific states
-51	China	**-8**	South America
-5113	Kiangsu province	**-9**	Other parts of the world
-51132	Shanghai	**-94**	Australia
-6	Africa	**-99**	Antarctica

The first line of a DD map call number is the area and subject number, and the second line is the cutter for authority or additional area information.

912.741 Area number for Maine
W29 Cutter for author

Alphanumeric

Seemingly the most popular of the map classification schemes are the alphanumeric. Three of the better known alphanumeric systems are U.S. Library of Congress, Boggs and Lewis, and the American Geographical Society. To conserve space and to mark myself as a thoroughly indoctrinated government documents librarian, the three systems will hereafter be referred to as LC, B&L, and AGS respectively.

The U.S. Library of Congress classification system, schedule G, is considered to be one of the best classification schemes for maps, as it is capable of expansion and compression. The present edition of LC's schedule G has a publication date of 1954, reprinted in 1966. This is not quite as bad as it seems, as LC's subject cataloging division puts out *L.C. Classification—Additions and Changes* quarterly. Obviously there has been considerable political change in the last nineteen years. LC temporarily deals with this bothersome circumstance by cuttering the old numbers assigned to areas that later became independent. Maps are given the numbers G3200 to G9980. Each major cultural or political unit of the world is assigned a block of numbers with the listing consisting of the letter "G" followed by four numbers, each block of numbers has the endings 0 through 4, or 5 through 9.*

The subject code is composed of the A through S, an example is given of the breakdown within one subject, D, Biogeography *

	A	Special categories	**E**	Human and cultural geography
	B	Mathematical geography		
	C	Physical sciences	**F**	Political geography
⌈	**D**	Biogeography	**G**	Economic geography
|	**D1**	General (plant and mineral distribution)	**H**	Mines and mineral resources
*			**J**	Agriculture
|	**D2**	Plant geography	**K**	Forests and forestry
|	**D4**	Animal geography	**L**	Fish and fisheries
⌊	**D5**	Wildlife reservations	**M**	Manufacturing and processing

N	Technology Engineering Public works	Q	Commerce and trade and finance
P	Transportation and communication	R	Military and naval geography
		S	Historical geography

Call numbers for maps consist of at least three parts in the LC classification, for general maps with area number ending in 0 or 5

G4280 Washington State
1947 Date of publication
C7 George F Cram Co Inc

or, for a subject map with an area number ending in 1 or 6, with subject codes A through S (although subject code letters may also be assigned to any map, with area number ending 2 or 7, 3 or 8, and 4 or 9)

G4281 Subject map of Washington State
C5 Geology
1961 Date
U5G4 U S Geological Survey

LC uses only one cutter number for author, but if government agency issued maps are frequently classified, it will be found to be advantageous to cutter both from the political unit and from the first significant word in the issuing agency's name. Some libraries prefer to use acronyms for author, i e , USGS for the U S Geological Survey If this method is preferred, an authority file of author codes must be set up

For a regional map, with area number endings of 2 or 7, cuttered A through Z

G4282 Regional map of Washington State
W4 Wenatchee National Forest
1959 Date
U5F6 U S Forest Service

or for a county map, with area number endings of 3 or 8:

G4283 County map of Washington State
K5 Kittitas County
1963 Date
M4 Metsker Maps

or, for a city map, with area numbers of 4 or 9

G4284 City map of Washington State
E4 Ellensburg
1969 Date
E4C5 Ellensburg Chamber of Commerce

Some libraries may prefer to change the order of the bottom two items in the call number, and indicate authority on the third line of the call number and date on the fourth

In classifying series of maps, the date in the call number is replaced by the denominator of the scale minus the last three digits, and preceded by a small "s":

G4280 Washington State
s25 series whose scale is 1 25,000
U5A7 U S Army Map Service

The above is a recent revision of the series classification system Formerly the class number for series was arranged in this fashion:

G4280s Washington State, series of maps
25 scale 1 25,000
U5A7 U S Army Map Service

Both B&L and AGS classification systems are not part of over-all classification schemes, as is LC, but are devoted exclusively to maps and atlases. In both B&L and AGS, different areas of the world are represented by numbers

	B&L
000	Universe
100	World
200.300	Europe
400	Asia
500	Africa
600	North America
700	Latin America
800	Australia New Zealand
900	Oceans

	AGS
000	Universe
050	World
100	North America
200	Latin America
300	Africa
400	Asia
500	Australasia
600	Europe
700	Oceans
800	United States
809	Alabama
810	Alaska (etc.)
894	Wyoming (last number)

Location symbols are a prefix to the first line of the call number in B&L, and a suffix to the first line in AGS. They are used to designate the type of map for filing purposes:

B&L		AGS	
w	wall maps	a	wall map
s	sets of maps filed apart	b	sets
r	relief maps	c	regions
g	globes	d	cities

Subjects are represented by letters:

B&L		AGS	
a	general maps	A	Physical
b	mathematical geography	B	Historical-political
c	physical geography	C	Population
d	biogeography	D	Transportation, communication
e	human geography		
f	political geography	E	Economics
g	economic geography	F	Geophysical
h	history, naval geography	G	Geology
n	history of geographical knowledge	H	Hydrology
		I	Meteorology, climatology
p	history	J	Mathematical geography
		K	Astronomy
		L	Zoogeography
		M	Miscellaneous

The following call numbers are examples, for a wall map of the geology of the United States, published by the U.S. Geological Survey in 1930. Note the subject representation and location symbols in each system:

B&L	AGS
w630caq 1930U	800-a G-1930

In both B&L and AGS, class numbers consist of at least three digits, to which decimals may be added. In B&L, the numeral 7 is assigned to counties in the United States, the numeral 8 to miscellaneous minor regions within a state, and the numeral 9 to cities.[6]

641.7	Counties in Maine	**641.712**	Androscoggin County, Maine
641.8	Regions in Maine	**641.81**	Baxter State Park, Maine
641.9	Cities in Maine	**641.91**	Bangor, Maine

The numbers to be used following the general city number are determined by the name of the city, for city names beginning with A-B, .1 is used, for those beginning with C-E, .2 is used, and so forth. There is also an expanded city notation, in it, cities beginning with the letters Aa-Ak use .11, and so forth. Decimals are used in AGS for islands, gulfs, some cities, and regions, such as the USSR's ASSRs (Autonomous Soviet Socialist Republics). Call numbers are constructed as in the following examples, which classify a geological map of Africa.

B&L:	**500caq**	Area number; subject letters
	1930R	Date of publication; first letter of author's last name, which is Rawlins
AGS:	**300**	Area number
	G-1930	Subject letter; Date of publication

For comparison (and also to satisfy my basic masochistic tendencies), I decided to classify one map by each system mentioned in this paper. The titling systems, both USGS and the University of Washington, were quickly done, and Miss Eleanore Wilkins, Librarian, U.S. Geological Survey, Menlo Park, was kind enough to send me the proper classification number for that system. LC was exceptionally easy to apply, as this is the system by which I have classified maps for the last three years, and B&L and AGS, which I have never used before, were also very easy to use. DD was another story altogether. I last did DD classification in library school four years ago, and have assiduously endeavored to forget it ever since. It would seem that I have succeeded beyond my wildest expectations. After reading the editor's introduction to DD - twice - and asking two other librarians, one of whom classifies by DD and one of whom teaches it (and receiving two different opinions), I have at last arrived at a call number that I think may be correct. However, I shall certainly listen to opinions to the contrary.

The Map: Washington (State) Dept. of Mines and Geology. Geological map of Washington. Olympia, 1961. scale 1:500,000

University of Washington: **WA**
Geol
1961

USGS Washington, D C **WASHINGTON (STATE). GEOLOGY. 1:500,000 1961**

USGS Menlo Park **M(284)m W4g** DD **912.155797 W317g**

LC **G4281 C5 1961 W3M5** B&L **697caq 1961Wg** AGS **891 B-1961**

Perhaps the best way to decide upon a classification system is to ask, first, whether it is desirable to classify by geographic area, subject or size. Area is clearly the best for most libraries; subject is appropriate only for highly specialized libraries that deal with thematic aspects of one major geographical area, and filing solely by size seems to ignore the user and his requirements.

Next, the librarian must decide how he intends to indicate the mode of classification, verbally, numerically, or alphanumerically. He again runs into the old library problem of simultaneously providing the user with the information requested as quickly and plentifully as possible, and providing sufficient bibliographic control (or rather, cartographic control) to keep the librarian happy. Titling makes the most sense as far as the user is concerned, as it is far easier for a user to read the name of an area than it is for him to hunt up the appropriate number for the area in which he is interested in a schedule, putting the titling in columnar rather than linear form would seem to make it easier for the user to grasp the information at one glance. However, bibliographic control is more easily attained by utilizing numbers, particularly if electronic data processing equipment is to be used. Of the numeric systems, USGS is set up for a specialized library and may not be completely suitable for general map libraries, and DD should definitely be avoided; the numbers are long and cumbersome and the system is simply not suited to maps. Of the alphanumeric systems, LC and AGS seem to be the best. B&L, while a good system, has unfortunately not been revised since the mid 1940's, while both LC and AGS are reasonably up to date. LC is an excellent choice for maps in a library which already uses LC. Recently revised, easy to apply, and with a good list of subject headings, AGS is perhaps the most attractive system, particularly for beginners in geography, cartography and/or library science.

At the base of all the foregoing is the dichotomy of suitability and practicality. Certainly the librarian wants to use the classification

system most suited to his clientele and collection, but he must also take into account the money and materials with which he has to work. As it was put some twenty years ago, "keep map classification as simple as possible."[12]

Notes

1 American Library Association, Editorial Committee, Subcommittee on Library Terminology. *ALA Glossary of Library Terms, With a Selection of Related Fields* (Chicago: American Library Association, 1943), p. 43.

2 Special Libraries Association, Geography and Map Division, Committee on Map Cataloging, "Final Report," *Geography and Map Special Libraries Association, Division Bulletin* no. 24 (April 1956): 4.

3 Lloyd Brown, *Notes on the Care and Cataloging of Old Maps* (Windham, Connecticut: Hawthorn House, 1941), p. 29.

4 Barbara Christie, "Map Classification: Basic Considerations and a Comparison of Systems," *Western Association of Map Libraries Information Bulletin* 4 (March 1973): 33.

5 Brown, p. 29.

6 Christie, p. 33.

7 Ibid., p. 34.

8 Interview with Lee Hubbard, University of Washington, Seattle, Washington, 12 April 1973.

9 George Goodwin, Jr., Chief Librarian, U.S. Geological Survey, Washington, D.C., personal letter, 5 March 1973.

10 Ibid., enclosure.

11 Eleanore E. Wilkins, Librarian, U.S. Geological Survey, Menlo Park, California, personal letter, 23 April 1973.

12 Melville Dewey, *Dewey Decimal Classification and Relative Index*, 17th ed., vol. 2 (Lake Placid Club, New York: Forest Press, 1965), p. 1154.

13 Ibid pp 1267-1502

14 Ibid Vol 1 pp 123-374

15 Carlos Hagen, *An Information Retrieval System for Maps*, rev ed (Los Angeles University of California, 1967), p 1

16 Ibid , p 3

17 U S Library of Congress. Subject Cataloging Division. *Classification. Class G Geography. Anthropology. Folklore. Manners and Customs. Recreation*. 3rd ed with supplementary pages (Washington, D.C.. Government Printing Office. 1954. reprinted 1966). p 177-181

18 Ibid , p 173-175

19 Ibid , p 175

20 Samuel W Boggs and Dorothy Cornwell Lewis, *The Classification and Cataloging of Maps and Atlases* (New York Special Libraries Association 1945), p 96

21 Roman Drazniowsky. *Cataloging and Filing Rules for Maps and Atlases in the Society's Collection*, rev ed (New York American Geographical Society 1969) p 62-70

22 Boggs p 25

23 Drazniowsky p 2 4 17 23 27

24 Boggs p 128-140

25 Drazniowsky, p 19-20

26 Boggs p 22

27 Ibid p 119

28 Drazniowsky, p 62-70

29 Wilkins letter

30 Brown p 32

Non-Geographic Methods of Map Arrangement and Classification*

Ralph E. Ehrenberg

Despite the general consensus among map librarians, geographic area is not the only criteria by which maps can be arranged and classified. Map collections can also be arranged and classified by provenance, subject, or format depending upon the collection's scope, purpose, content, and physical condition. Maps prepared or accumulated by public and private authorities for administrative or legal purposes generally fall into natural organic groups and series. These maps are usually found in archives or manuscript map collections and should be arranged and classified according to the principle of provenance. Maps prepared individually or in sets for scholarly or illustrative purposes to show geographical, political, or general cultural information in graphic form do not fall into natural organic series. These maps are usually found in reference libraries and historical societies. While they are normally filed by geographic area they can also be arranged and classified by subject. Both kinds of maps may also be arranged by format when preservation and lack of space are prime considerations.

Provenance

The principle of provenance provides the theoretical framework for arranging and classifying documents in both archives and manuscript collections. It prescribes that documents created or accumulated during private or public transactions are to be kept together according to their origin. The principle of provenance should not be confused with the term "provenance" as used by

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map librarians to designate the author of a map or the place from which private maps were purchased or otherwise acquired Rather, it emphasizes the *organic* origins of the document, that is, the process which brought it into being as well as its relationship to other documents that were created at the same time

Map archivists arrange and classify archival maps according to the principle of provenance for several reasons. First, it is practical and economical. Archival maps are usually arranged in a logical and meaningful way by the agency of origin It is wasteful in both time and money to create a new arrangement system when one already exists Moreover, it is likely that if maps were arranged by an agency, they are probably accompanied by registers, indexes, and other finding aids which would be invalidated by a rearrangement Second, it aids in the identification of archival maps, many of which were compiled hurriedly in the field and are untitled, undated, and unsigned Their identity can be ascertained only within the context of their original arrangement or by reference to closely related textual documents which are also arranged according to the principle of provenance Third, it minimizes the problem of integrating maps with related textual documents Since archival maps, due to their large format, are physically separated and filed apart from textual documents, it is important that both groups of records be kept according to the same arrangement scheme so that their research use can be coordinated When the principle of provenance is disregarded by map archivists and maps from different sources are interfiled into an arbitrary scheme, such as geographical area, this coordination becomes virtually impossible

Although the principle of maintaining records by their origin has gained universal acceptance in the archival profession, the usages growing out of this principle vary from country to country and from archives to archives Depending upon national and individual preference, archival maps are arranged and classified by administrative organization, administrative function or a combination of structure and function

Organizational Approach

The objective of the administrative organizational approach is to arrange maps in such a way as to show by their placement

in map cases the organization of the agency that created the maps. The first step in this process is to analyze carefully the structure and function of the body that produced the maps. This can be done by studying administrative history, by analyzing available organizational charts, and by personal interview. Only by gaining a thorough knowledge of the organization and purpose of the map-collecting or map-producing body will the map archivist be able to devise an arrangement scheme that reflects the organic origin of the maps.

Following this initial investigation, arrangement and classification can begin. Oliver W. Holmes has identified five levels of arrangement that apply to maps as well as to textual documents: 1) the depository level; 2) the record group and subgroup levels; 3) the series and subseries level; 4) the filing unit level; 5) the document level.

The first level of arrangement is undertaken when maps are received by an archives or manuscript repository. Individual maps and maps in natural groups (map sets or series) should be allotted directly to the map collection. Maps attached to textual documents should be filed with the textual documents unless they are in poor condition or are folded. The latter should be separated from the documents to which they are attached, unfolded, and filed in the map collection. The presence of large documents among smaller ones, according to Hilary Jenkinson, is one of the cases where removal of a document from its proper place is justified in the interest of its preservation.[3] All maps separated from textual documents must be cross-referenced to the documents from which they were removed.

The next level of organization is achieved when the newly accessioned maps are assigned to a record group, which is defined as "a major archival unit established somewhat arbitrarily with due regard to the principle of provenance and the desirability of making the unit of convenient size and character for the work of arrangement and description and for the publication of inventories."[4] In the National Archives a record group consists of the documentation produced by a Federal administrative unit at the bureau level, such as the Office of the Chief of Engineers or the former Coast and Geodetic Survey. Once established, the record group becomes the basic unit for administrative control of the records. Each record group is assigned its own unique identifying number.

According to the principle of provenance, each accessioned map must be allocated to a record group. Fortunately, the majority of accessioned maps are easily identified as to its creating or collecting authority. If the provenance of a map cannot be determined, it is not an archival map. The Cartographic Archives Division of the National Archives has established a small reference map collection for non-record items that may be of use to researchers. General reference maps of a non-record character that may have been accessioned along with archival maps also are placed in the reference map collection.

It is often impossible to arrange a record group in a logical and systematic pattern. The complexity and fluidity of official map-producing and map-collecting agencies and the generally irregular transfers of maps from these agencies makes it difficult to plan an arrangement that will anticipate all future contingencies. It is therefore necessary to keep an up-to-date floor plan as a guide to the location and physical movements of all record groups.

Within the record group, maps usually fall naturally into two or more subgroups. These include the following categories: general records, which consists of miscellaneous maps that show information of an administrative nature (such as the location of regional offices); records of the central office; and records of the regional offices. Maps prepared by a predecessor agency may form a fourth subgroup. Whatever the subgroup breakdown, the maps in each record group should be filed in a continuous block of map cases in a systematic fashion from top to bottom, and from left to right.

The third level of arrangement and classification is the series—"the heart of archival work."[4] A series is composed of interrelated homogeneous filing units arising from organic activities or transactions. In the National Archives a map series may consist of the central map files of an agency or the maps produced by an administrative unit at the division level.

Map series accessioned from map-producing or map-creating agencies normally should be maintained intact. Their arrangement consists of checking and verifying the natural order and revising it where necessary. If an agency's method of arrangement is illogical and unworkable, however, "there should be no compunction about rearranging map items . . . if by such a rearrangement they can be made more intelligible and more serviceable."[5]

Artificial series must be created for those map series that require rearrangement and for those groups of maps that are obviously related but for which no discernible pattern of arrangement exists. The initial step in creating an *artificial* series is to inventory the maps in the order in which they are found "without disturbing the relationship of the unit or of the dissimilarity that separates them."[6] During the inventory each map should be examined briefly and listed by abbreviated title on a card or a slip of paper. Each title card and corresponding map unit should be given a provisional number at the time the title card is made. This procedure should be carried out as rapidly as possible; full cataloguing can follow later. The objective at this point is to bring physical order and control to a group of related documents. After all the map units have been listed the title cards can be arranged in a logical order by kind, either geographically, chronologically, functionally, or by any other pattern that suggests itself. Once an acceptable pattern of arrangement has been devised on paper, the physical task of placing the map units in final order and assigning their permanent file number can proceed.

A file unit, the fourth level consists of an assemblage of related documents. In terms of maps, a file unit may consist of one map or it may consist of a set of maps. The maps comprising a file unit may vary in size, scale, and type of material; their only common denominator is their common origin. Following the arrangement of file units within the series, the content of the file units themselves require ordering. Arrangement of the documents within the file unit is arbitrary. Generally only a few maps are involved. If a large number of maps must be arranged, a chronological approach is preferred. Each map which comprises the file unit should be identified by a double number to facilitate control and servicing. If a file unit, identified as Map 42, consists of 10 separate sheets, each sheet could be classified as 42/1-10, 42/2-10 . . . 42/10-10 or similarly 42 (1 of 10), 42 (2 of 10) . . . 42 (10 of 10). The first exponent indicates the place that the file unit occupies within the series, the second provides information on the number of sheets comprising the file unit.

No predesignated classification scheme can be applied that will encompass all map series or file units. Each archival series or file unit is unique. The classification scheme is established or identified only as the maps are analyzed. It must originate from the documents themselves, not from outside of them. The following hierarchical arrangement of the records of the Bureau of Agricultural Economics (Record Group 83) is illustrative of

classification schemes based on the administrative structure approach as utilized in the Cartographic Archives Division of the National Archives

Depository Cartographic Archives Division National Archives
Record Group Records of the Bureau of Agricultural Economics (*RG 83*)
Subgroup Records of the Office of Farm Management and Farm Economics
Series General Records
File Unit 1 Published land classification quadrangel maps [2 items]
File Unit 2 Manuscript maps of the U S compiled from studies of truck farming in 1898 [27 items]
File Unit 3 Maps compiled by W J Spillman relating to grass and forage plant investigations [25 items]
Series Division of Agricultural History and Geography
File Unit 7 Maps prepared for the *Atlas of American Agriculture* relating to climate [27 items]
File Unit 8 Advance section of the *Atlas of American Agriculture* entitled "Rural Population [1 item]
Subgroup Records of the central office of the BAE
Series Division of Land Economics
Subseries General Records
Subseries Land Classification Section
Subseries Land Utilization Section
Subseries General Records
Subseries Records of Oliver E Baker
Subseries Records of Francis J Marschner
File Unit 147 Soil map of the United States [2 items]
File Unit 148 "Physiographic Diagram of the United States by A K Lobeck [1 item]
File Unit 149 Maps relating to studies of railroad land grants and land use in the Western States [15 items]
Subgroup Records of the regional offices of the BAE
Series Atlanta Office (*Region 5*)
Series Berkeley Office (*Region 7*)

Functional Approach

The objective of the functional approach is to arrange and classify maps according to the purposes for which they were collected or produced Unlike the organizational approach, it does not require an extensive knowledge of administrative history by

either the archivist or the researcher It is therefore easier to implement and easier to use. Moreover, natural map series arranged according to function will not have to be divided among several record groups following an agency reorganization as is likely to happen to maps arranged by the organizational approach.

The functional approach can be applied to an entire collection or to a selected series within a collection. In the first instance the basic functions of all the agencies whose records comprise the collection have to be determined. The maps of the Modern Section of the *Archives Nationale* which postdate 1789, are classified by the major functions of the French government such as judiciary, fiscal, and administrative in order to correspond to the textual records with which they were originally associated. The classification scheme is simple; it only requires symbols for the *fonds* (record groups), the series, and the container housing the document. The *fonds* are designated by one or several capital letters, series by superscript Arabic or Roman numbers, and the container by Arabic numerals. Thus F 21 means *fonds* F (General Administration of France), series 10 (Agriculture), container 21

The functional approach can also be applied to records at the group and series levels that have been arranged according to the organizational method Arrangement and classification "becomes a simple process of determing the functions performed by any given agency and then arranging the series in a rational order in groups which will emerge from the pattern thus established." Functional maps series that are most likely to emerge are those composed of records pertaining to boundaries, canals, roads, railroads, land surveying, and military campaigns Within the series, the file units are generally arranged chronologically

The functional approach need not be limited to maps in archives and manuscript collections The map files of surveyors, construction firms, planning boards, and realtors all lend themselves to arrangement by function since they consist of maps prepared or collected for specific purposes Useful schemes have been developed for a real estate map collection by Thurston H. Ross and for a land surveyor's map collection by Forrest Daniell

Subject

In subject arrangement maps are grouped together into artificial

classes such as railroads, roads, canals, and topography. Like the functional approach, which it resembles, it is easy to use by researchers but it is more difficult to implement. Both the selection of classes and the sorting of maps according to those classes pose difficult problems. For these reasons subject arrangement is generally limited to relatively small map collections composed of special purpose maps of a social, economic, or cultural nature.

The selection of classes is completely arbitrary but for good control the number of classes selected should remain relatively small. The map collection of the University of Kansas Library consists of 26 classes arranged in groups of related subjects such as geology and physical geography (geology, minerals, water supply, terrain, climate, vegetation, resources), agriculture, population, transportation (railroads, roads, waterways, air), economics (power, manufacturing, trade), etc. These subjects were "developed on the basis of the existing maps in the collection and with reference to various published listings of map subjects."[1]

The sorting of maps according to class presupposes considerable geographic and cartographic knowledge on the part of the map custodian. Subjects often overlap. For this reason the map custodian must guard against the temptation to select classes that are too general in coverage. Maps from an earlier period usually include more than one subject and therefore are particularly difficult to class. "Old maps," writes Lloyd A. Brown, "usually incorporate several subjects . . . a single map of a state or province might contain, besides the political boundaries, an inset city plan, an elevation of a building, the text of an Indian treaty, the roads, rivers, and mountains, in short, all the known physical features of the region."[2] One way out of this imbroglio is to place all old maps under the general subject heading "Historical Maps." The map collection of the Surveyor General's Office of the State of Georgia has an "Historical Maps" file which relates to Georgia and the southeastern section of the United States. Within this file maps are arranged chronologically.[3]

While arrangement of maps according to subject usually remains limited to small map collections, subject has long held an important place in classification schemes. Since S. W. Boggs first revealed its usefulness at the map library of the U.S. Department of State in the 1930's, it has become the secondary basis for classification of maps in most map libraries. A full discussion of subject classification is found elsewhere in this issue of the *Quarterly*. (See article by Mary Larsgaard, p. 37.)

Format

Arrangement of maps according to their size and form, irrespective of origin and content, is based upon preservation considerations and more effective utilization of stack area space. "There are two great advantages in sizing maps," writes Theodore Layng. "First, maps are notorious space users; sizing them can utilize space 30% more efficiently. Secondly, sizing increases the life span of maps; more compact filing classes are established, eliminating the hazard of outsize maps in a group acting as buffers for their mates."[14]

All map custodians recognize to some degree the need for filing maps according to format. The existence of map collections as separate units apart from books and textual manuscripts is tacit acknowledgment that material of similar dimensions should be filed together. Moreover, selected map series, such as the U.S. Geological Survey quadrangles or the International Millionth Map of the world are normally stored together while exceptionally large maps and wall maps are rolled and placed in cardboard tubes or cylinders.

The first step in arranging maps by size is to select the categories of physical types that will constitute the collection. Some physical types will correspond to map content. The map collection of the University of Kansas, for instance, is arranged according to topographic and special purpose maps. "The topographic section is more uniform, being largely composed of bulky, large scale sets, in each of which the sheets are mostly uniform size and paper quality. In contrast, the subject maps are mostly medium or small scale and vary widely in sheet size and paper quality."[15] Other categories are determined by the materials of which the maps are made. One of the five categories of the *Department des Cartes et Plans, Bibliothèque Nationale*, consists of maps on vellum—the largest such collection in the world.[16] Still other categories are selected on the basis of storage mediums such as envelopes, hooks, tubes, portfolios, shelves, platforms, and vertical and horizontal map cases. "Every form in which a map has been seen should be considered. Every conceivable way of storing maps should be thought out."[17]

Within each category there is usually a further subdivision by size. The flat sheets of the map collection of the Transvaal Archives are arranged according to three sizes. 33 x 30 inches, 45 x 33 inches, and 50 x 40 inches. Maps larger than 50 x 40 inches are "mounted

either on rollers or carefully dissected by the bindery and hinged so that folding would not damage them."[18]

Since maps arranged according to format have no intrinsic relationship to each other in the storage unit, their classification is particularly important. Each classification number must therefore include both an area code number as well as a category symbol for the purpose of location. The location symbols employed "should be descriptive, simple and definite."[19] The Newark Public Library formerly employed as location symbols the abbreviations "Env." for dissected maps mounted on cloth and folded for placement in envelopes; "M.P." for maps on rollers hanging from a map platform; "H" for large rolled maps hung from numbered hooks in compact storage; and "S" for unmounted sheets in flat storage.[20]

A larger collection, the National Map Collection of Canada, employs a more sophisticated system of location symbols. The category "V", which represents flat maps stored in vertical map cases, includes more than twenty sub-categories based on size, function, or map content.[21]

Regular Classification
V1 — Narrow Case
V2 — Wide Case
V3 — Gabbs Case
V4-5 — Reserve

Federal Surveys
V6 — Topographic Series
V7 — Geological Series
V8-10 — Reserve

English Charts
V11 — English Manuscript Charts
V12 — English Admiralty Charts, Printed
V13 — English Non-Official Charts, Printed
V14-19 — Reserve

French Charts
V20 — French Manuscript Charts
V21 — French Official Printed Charts
V22 — Non-Official Printed Charts
V23-29 — Reserve

Reports
V30 — Owen s, Phillpats, etc

Special
V40 — Fortification Survey

An area code number and date of map complete the classification number. Thus in the National Map Collection of Canada "F100 1960" means category "F" (folded maps of the regular classification series), area 100 (Newfoundland), year 1960 (year of edition). A card catalog filed by area brings together all maps of the same locality.

Notes

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20 Marie Louise Prevost "Is Classificatory Approach the Best for Maps?" *Library Journal* 71 (15 January 1946) 94

21 Theodore E Layng "Care and Preservation of Maps," *Proceedings of the First National Conference on Canadian Map Libraries June 14-16, 1967* (Ottawa Public Archives of Canada 1967), pp 39 figure 1

Preservation and Maintenance of Maps*

Marie T. Capps

Map preservation and maintenance can be easy for every librarian. Information on the causes of map damage and deterioration as well as suggestions for proper storage and care is readily available. It behooves the librarian to familiarize himself with the source materials on the problems of preservation and care of maps and to use the means available to him to establish proper procedures and methods to conserve the maps in his library's collection.

Map care is relatively simple if properly undertaken. One asks himself, "When and where does conservation of maps begin?" As soon as the map is made deterioration commences, so preservation on the part of the librarian must necessarily begin upon the arrival of the map in the library. If the map is new and direct from the maker, the librarian's job may require only cataloging and storing.

Older maps usually require more attention. Repairs to damage should be made upon receipt. Good storage facilities, controlled environment, and careful handling along with proper repair when damage appears, will increase the longevity of the map. Prevention of damage is sometimes expensive, but it is more reasonable than restoration and considerably less expensive than replacement of valuable and rare maps damaged and destroyed by neglect. Assuming a preventive maintenance attitude on the part of the librarian is not only economical but is necessary to keep the maps in good condition. The classic reference on the physical

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techniques for map handling is Clara LeGear's *Maps, Their Care, Repair, and Preservation in Libraries* (Washington, D.C. Library of Congress, 1956). Information on all aspects of map care except repair of acid and fungus damage are discussed in this work.

To better understand the problem of map conservation, one must recognize the causes of map damage and deterioration. In this area, a comprehensive, practical and useable guide for map librarians is George D. M. Cunha's *Conservation of Library Materials* (Metuchen, N.J.: The Scarecrow Press, 1967). Cunha describes map damage, the forces causing it, and the methods for repairing the damage as well as procedures for prevention of further damage. He also offers a commentary on the information sources available and valuable appendices which contain vital preservation data and formulas. For all aspects of map conservation, the librarian would do well to consult this noteworthy and timely publication

Damage to maps is either chemical or mechanical, or a combination of both ' Chemical damage results from the reaction of the acid in the paper with the environmental conditions—the light, heat, air, and humidity—where the maps are housed. Mechanical damage, evidenced in the tears, rips, missing portions, creases and folds in the maps, is attributed to people, rodents, insects, and oftentimes to improper storage

Chemical Damage

Perhaps the most destructive unseen enemy in the library is acid Acidification of paper occurs during the manufacturing process; consequently, deterioration begins immediately, long before the item reaches the librarian, and the invisible action of acid in paper often passes the danger point before it is detected Discoloration and brittleness are signs of chemical attack in paper This visual evidence of deterioration should alert the librarian so that he may take steps to arrest the condition. One can clearly see the results of acidification in the paper produced in the period during and after the Civil War and into the 1920's. Even the little used maps of the period are brittle and crumbling. Fortunately, scientific research has come to the assistance of the library. Means of testing paper for acid content and processes for removing the acid from paper have been discovered, and the results are available in Cunha and Barrow · William J Barrow was a pioneer in the field of deacidification and lamination and introduced the process which bears his name. In the Barrow process the paper is pretreated in

liquid baths which neutralize actual or potential acidity before the item is laminated. These liquid baths, in which the chemicals act to deacidify the paper, are equally important for the preservation of paper that is not to be laminated. The restorative measure of adding moisture to the dehydrated, brittle paper takes place simultaneously. In a recent article Dr. Richard D. Smith relates the results of a study of map papers testing both the aqueous or chemical baths and the nonaqueous treatments as protection against the development of harmful acidity in the paper. The results indicated that both the aqueous and nonaqueous treatments are effective in deacidifying paper and that the nonaqueous treatments provide more protection against future development of harmful acidity. However, the librarian should note that although deacidification treatments do extend the longevity of the maps, they do not extend the life of map paper indefinitely.

It is not unusual to have a map arrive at the library framed with a wood backing. This backing should be removed immediately because the resins and acids in the wood darken and weaken a map. Airborne moisture collects in loosely fitted frame and stains the contents. It is not unlikely that the matting and the paper behind it are highly acid and should also be removed.

Lamination, the process in which a combination of cellulose acetate film, and usually a strengthening tissue are applied to the sides of a document or map by using heat and pressure, is a recommended method of preservation, if the entire map is to be repaired and strengthened. Laminating and chemical baths require training and skill and should be done by specialists. This process is recommended only for those maps receiving frequent or constant use and for those which are at the point where they cannot be repaired by traditional methods. It is not advisable to use heat-sealable types of plastics for archival maps and documents as this process is irreversible.

Atmospheric Impurities

Few of us today are unaware of the unseen impurities in the air which harm people—and damage maps. Sulphur dioxide, hydrogen sulfides, ammonia, nitrogen dioxide, ozone and aerosols are known contributors to the decomposition of paper. No library is safe from the impurities in polluted air, thus the librarian stands to gain from the current campaigns to rid the nation of polluted air. Air conditioning, either through room or central systems, will filter the air, eliminating some of the noxious gases and minimizing chemical deterioration.

Temperature

Heat, though essential for the comfort of the patrons of the library, helps produce conditions necessary for the growth of mold and fungi, encourages the presence of rodents and insects, and accelerates the chemical deterioration of paper. The heat of accidental fires will damage maps even though untouched by the flames. Intense heat causes paper to lose its fold strength and to become brittle. This condition also results when maps have been stored in an unventilated, uninsulated room near radiators or in lighted display cases. Low temperatures and low humidity act to decrease the rate of deterioration, and refrigeration of library materials prolongs their useful life. Controlled temperatures ranging from 60°-75° should be maintained. Air conditioning, by improving the ventilation, also decreases the rate of deterioration. Needless to say, fire preventive measures are essential at all times and should be checked periodically.

Moisture

The moisture with which librarians are concerned is water vapor or humidity in the air. To a certain degree such moisture is needed for the preservation of maps, for it sustains the flexibility of the paper, but either excessive moisture or insufficient moisture may be harmful. The absence of water vapor does inhibit the rate of bleaching, but it weakens the paper. Mold and fungi are encouraged and thrive in moist environments. (See below.) Floods of any kind, whether caused by leaking pipes, water from fire hoses, or natural disasters are the librarian's nightmare. Spilled drinking water and coffee are minor disasters of the same order. When they do occur, the librarian must act quickly to remove the stains and dirt, and dry the maps before they become soft and spongy and disintegrate. Techniques developed and used to save the library materials damaged by the 1966 floods in Florence, Italy are benefiting all libraries and have been called to use in the recent floods in Harrisburg, Pennsylvania and Corning, New York.

Humidity control is the most effective means of preventing mold growth and thereby decreasing the chemical deterioration of maps. For optimum preservation, the relative humidity should be maintained at 50%-60%. Where central air conditioning is not available, the humidity may be reduced or increased by mechanical units. A direct reading hygrometer is useful in the environmental control of all library materials.

Light

Either excessive light or insufficient light is damaging to maps. Natural or artificial visible light bleaches the colors in maps. The ultraviolet light present in daylight and in fluorescent lamps causes the paper in maps to become brittle and lose strength if exposed for prolonged periods. Maps exposed to these harmful rays become particularly sensitive to damage by alkalis during restorative processes. Display cases rarely are constructed for optimum protection of the materials displayed. The window glass does not filter out the ultraviolet rays, and the fluorescent tubes emit the same dangerous rays. To minimize the damage of the light, protective plastic sleeves especially made for this purpose may be used over the ordinary fluorescent tubes. Also available are fluorescent lights with a special coating which eliminates the ultraviolet rays. Surprisingly, incandescent light is the least damaging to maps and is probably the least expensive lighting to use. However, one must not overlook the fact that light is also an ally, in that it hinders the growth of fungi and routs vermin.

Mechanical Damage

Mechanical damage results from action of thoughtless users, rodents, household insects, and sometimes poor storage. Also included in this classification might be surface soil, repairs, and organic damage resulting from mold and fungi. Avoidable damage is done to maps by uninformed librarians with good intentions who use pressure sensitive tapes for mending, synthetic adhesives, highly acid paper for protective folders, improper storage, wood backing in map frames, and amateur lamination.

"People-type" Damage

One of the basic principles in the repair and restoration of maps is to do nothing which cannot be undone. When repairing rips or tears, the reinforcing material should be affixed to the paper with a bonding medium which is soluble in water. Pressure sensitive tape should never be used to repair maps, such repairs are only temporary and the chemicals in some adhesives leave a stain that can not be removed. Some tapes make claims to be non-staining and more permanent, but because there is little information on the materials in these adhesives, it is advisable to avoid them. Polyvinyl acetate formulas, for example, are good adhesives and nothing more. They make very strong bonds which may or may not be

reversible. Use only the endorsed products from a reputable supply house, and even then the reversibility should be checked before applying to valuable maps

Maps should be kept dust and dirt free. However, selection of folders and wrappers warrants careful attention. Highly acid, inexpensive cover papers will do more damage than the dust. Acid in low grade paper migrates rapdily to the material in contact with it. Newsprint, besides being highly acidic, absorbs and retains moisture producing ideal conditions for mold growth and should not be used. Employing acid free folders protects the map from user damage, and dust and dirt, and reduces restoration costs.

Rodents and Insects

The map librarian must guard constantly against those rodents and insects which live in dark recesses of the building and emerge in search of food, and those invisible agents such as mold and fungi which live on and destroy library materials. Of the seventy species of insects attacking library materials, the most commonly found and easily recognized are silverfish, cockroaches, and termites. Silverfish devour paper for the starch and gelatin content; cockroaches thrive on glue and paste; and termites will take possession of a drawer of maps and continue to eat until the contents are shredded and digested. Rodents, most often rats and mice, enjoy the seclusion and the warmth of map drawers and the abundance of available food in the form of paste, glue, and paper which they not only eat but shred for nests. Preventive measures for control of insects and rodents are necessary at all times. Professional exterminators making regular visits, and simple preventive steps taken by the librarian can eliminate these destructive creatures. It is far easier and less expensive to prevent the appearance of rodents than it is to combat and exterminate them once they have established residence

Mold and Fungi

Mold and fungi have been mentioned several times and deserve special consideration. Invisible to the naked eye and present in the air about us, they are quite harmless until they find ideal growing conditions, a humid, warm environment and subdued light and plenty of nourishment. Proper lighting and controlled temperature and moisture will discourage fungus growth. At the first sight of the powdery deposits characteristic of fungi on the surfaces of

infected materials, positive action to correct the temperature and humidity is necessary. All materials affected should be either brushed or vacuumed—outdoors if possible. If neglected, the affected paper becomes stained and serious erosion occurs in the surface of the paper. Ultimately, the paper will become soft and as absorbent as blotting paper, and eventually it will be reduced to a crumbling pulp.

One can distinguish between acid and fungus deterioration. Acid causes the paper to become brittle and to crack when folded. Paper attacked by fungi can still be handled and folded without breaking even though it is soft and weak. Papers vary in their ability to resist fungi depending on the chemical treatment during the manufacturing process. Because the average librarian is unable to detect fungi resistant paper he should be prepared to prevent fungi growth by environmental control.

Foxing is the term used to describe the discoloration and brown spots seen in old paper. It indicates that at some time or other fungi have been at work. The best available information on foxing is to be found in a study done in 1935 by Thomas Iiams and T. C. Beckwith at the Huntington Library.[4]

Storage

The responsibility and care of maps begins when they arrive at the library. It is a good practice to store maps flat and with as few folds as possible. Maps usually come rolled or folded, and once removed from the shipping container, they should be flattened for storage. W. W. Easton recommends ironing the map to remove the folds.[5] If the map is not needed for immediate use, I suggest that it first be placed on a clean flat surface under weights and allowed to remain there for two or three weeks. This simple procedure will remove most of the roll and folds and is to be preferred to the ironing process. The less contact the map has with heat the better, for heat accelerates the dehydration of the paper and lessens its durability. If necessary, cleaning and repair work should be completed before storing

The map librarian should know both his collection and his clients before making the decision to back or laminate his maps. Through experience the British Museum learned that it was false economy to file modern reference maps without backing them with quality paper or fabric. The constant use of these maps required repairs in

excess of what the original backing would have cost. A good rule to follow is to back or laminate those maps used frequently or that are in a weakened condition and disintegrating. It is costly and unnecessary to back all maps. Contrary to popular belief, good quality paper for backing will outlast fabric whose longevity is limited to between 20 to 30 years. Perhaps the future will find maps made on deacidified paper and laminated before they reach the library.

Proper storage is of great importance for it minimizes the wear and tear not only in patron use but in the retrieval and refiling. The best protective storage for maps is filing in acid-free folders in the horizontal drawers sometimes referred to as blue print or plan cases. It is generally agreed that map cases should be of steel for durability and the drawers should be no more than two inches deep. A report on various types of map equipment including a list of the manufacturers of steel map filing cases written by Catherine Bahn for the 1961 Special Libraries Association Committee on Standards,[6] and J. Douglas Hill's discussion on equipment for storing odd shaped maps, atlases, globes, plastic relief maps, and rolled maps both present valuable data to be used when selecting map storage equipment.[7] The most recent variation of the metal storage case resembles a chest-type freezer and holds over one thousand maps per unit. Each map has an individual acid free folder which is hung in a vertical position. This is more suited to the large size maps, but will accommodate smaller sizes. These cases tend to be expensive and out of the price range of libraries on limited budgets. For those who do not have map cases and whose budget limitations delay their purchase, a temporary, simple file may be made with plywood sheets and either 2" x 4" or 4" x 4" uprights. The plywood may be cut to any size specifications and will provide a solid flat storage surface. The maps must be protected from dust by inserting them in acid free, individual folders which absorb the wear caused by sliding the map in and out of the wooden shelves. Thrifty librarians can make folders of acid free paper which will prevent the transmission of acid from one map to another. Money spent for good storage facilities not only improves operating efficiency but also saves later expenses in restoration.

The Future

Modern technology will indeed have a great impact on map libraries. In these days of instant everything, maps are being

produced by computers, so it can be assumed they may eventually be transmitted by means other than their usual form. With the computer, the medium could well be video tape. While books and newspapers have been microfilmed for several years, the microfilming of maps has lagged. There are reasons for this. Books may be easily microfilmed by almost any individual after simple instruction, but maps, by their very nature and size, need an expert photographer because each marking is information that must appear if the reproduction is to be of value. Nonetheless, the microfilming of maps must increase; for try as we may, we cannot accumulate original maps ad infinitum. Microfilming is one means of preserving these for posterity. It would eliminate significant problems and would make map handling easier for the user and the librarian. Problems of transporting would be minimized, and size control could be governed by the reader. Not to be overlooked is economy: storage costs would be less in both space and money; packing and shipping costs would be less; maintenance would be minimal; and rare maps would become available to a wider clientele. Until the day when microfilming and computerization have eliminated the map problems, librarians must act to conserve the valuable and rare maps in their collections. There is an abundance of information available on the preservation and maintenance of maps, and the problems confronting the map librarian are not insurmountable. Familiarization with the source materials, and application of the accepted practices of preservation and maintenance will increase the longevity of the map holdings in any library.

Notes

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The Computer-Produced Map Catalog: Some Considerations and a Look at Operating Systems

B. F. Phillips

In this age of automation many map librarians are questioning the economy and efficiency of the traditional card catalog. Established libraries, as well as new ones, are looking to the computer for a faster and hopefully more economical tool for cataloging maps. With many variations of computerized systems operating, the librarian considering automation for the first time is understandably perplexed. This article will not provide all the answers, but is an attempt to give the uninitiated a better understanding of the problems involved.

One of the first tasks of the map librarian contemplating automation is to define the objectives of the library and the map collection within the larger system. This may seem so self evident as to be unnecessary, but it is an important first step. Aims of organizations do change. A teachers' college becomes a university. A liberal arts college may expand into technical programs. A government agency might shift from a closed research organization to one serving the general public. In any attempt to define the map library's goal, it is essential to know the users. Are they geographers, the general public, historians, city planners? How many enquiries are received daily, monthly?

Once the objectives are stated, a helpful next step is to compile a list of what you need to achieve those objectives. Do you want a document retrieval, an information retrieval system, or a combination of both? Some items are obviously more important than others, but at this stage, all should be listed and ranked. Do not leave out elements because you think they might be too costly or impractical.

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Once you know what you would like to get from a system, an examination should be made of all the options open to you. In most instances there are three choices. One is not to catalog the collection at all. If the clientele is small and the collection has only a few thousand sheets, a simple classified arrangement may be all that is required to provide good service.[1]

If it is evident that a catalog is required, the decision will then be between a manual system and an automated system. If there is an existing card catalog it should be thoroughly analyzed and all the operations used to produce it should be flow charted. Some minor modifications may satisfy your requirements and even save money. If there is no card catalog remember there are several manual systems and these should all be examined.[2]

Manual systems are reasonably standardized though there is the ever-present controversy over choice of main entry. Should it follow Anglo-American cataloging rules and be the author, or should it be area? In a computerized catalog there really is no main entry. Lists or catalogs can be generated by area, author, subject, or even date, scale, and language if you wish

Manual systems and computerized systems should be compared, always keeping your objectives in mind. Who should undertake this study? In a large institution there will likely be a systems department. If possible, a team consisting of at least a systems analyst and the map librarian should undertake the task. It is not possible to enumerate all the factors that should be considered as these will vary from library to library. Some, however, apply to all types of collections. Availability of labor, the levels of skill and their costs must be major factors. Is computer time available and are there charges? Are other parts of the library such as serials, loans, and acquisitions automated? Development of a system for maps alone would likely be uneconomical An automated system should be able to improve your service and provide benefits not possible with a manual system since the cost will certainly not be less and in fact may be considerably higher. Hardware costs for both manual and automated systems should be compared including such items as card stock, typewriters, catalog furniture, work sheets, and keypunch machines

In analyzing the two systems, the team should prepare a list of the advantages and disadvantages of both systems The State Library of Victoria (Australia), in its feasibility study, prepared the very useful table reproduced here

Table 3

		Computerized Book Catalog	vs	Manual Card Catalog
1	+	Portable	–	Fixed in place
2	+	Compact and bound	–	Voluminous and liable to displacement of individual cards.
3	+	No special furniture and floor space required.	–	Special furniture and floor space required.
4	+	Machine files entries fast and according to arbitrary rules.	–	Filing time-consuming, tedious, and prone to human error.
5	+	Machine assembles multiple file sequences from single master file	–	Manual filing in multiple file sequences repeats tasks and invites inconsistencies in order of cards.
6	+	Many entries can be scanned in one glance without turning the page	–	One or part of one entry can be scanned on one card
7	+	Speedy and comfortable page turning	–	Slow and fussy card moving
8	+	Multiple copies of whole catalog costs relatively little	–	Multiple copies of whole catalog prohibitively expensive
9	+	Saleable copies of whole catalog or parts easily produced.	–	Copies of whole catalog expensive and unsaleable
10	–	Updating file requires physical reproduction of old as well as new entries	+	New entries intercollated easily without changing old
11	–	Entries must usually be abbreviated to save printing and paper costs	+	Card reproduction technology permits each entry to carry full unit information at negligible cost.

12	−	Every printed line costs equally	+	Long unit cards may be reproduced at a negligible cost increase over short units
13	−	Revision only affects new editions of the catalog and must await updating of whole file	+	Revision limited to incorrect cards, may be immediate, and corrects all hard copy at once
14	+	Special access files easily created from master file (e g list of all pre-1850 publications may be produced by scanning publication date field and printing only pre-1850 entries)	−	Special catalogs must be compiled by hand and reproduced individually.
15	−	Trained staff and special equipment must be provided to produce machine readable cataloging and operate the computerized catalog system	+	Trained staff and standard equipment are already in library
16	−	New financial support categories must be established.	+	Funds may be drawn from existing financial support categories
17	−	Development costs high	+	Systems time-tested and standardized

Each library situation is different and there may be additional items in your list. Point number 14 concerning special files might be considerably expanded. The spin-offs from a computer system are many. Accession lists can be generated, as can lists by title, scale, date, or language.

In your analysis it will doubtless be easier to examine the manual systems. Most are in general use in many libraries. Costs are easily obtained and the advantages and disadvantages are already well known. Automated systems vary greatly as the descriptions which follow show. Unlike the card catalog, each computer system is used in only one library. Any comparison of costs, benefits, and drawbacks will, therefore, depend on what *you* mean by a

computerized system. Development costs of new systems can be high.

Automation is not a panacea. It can be helpful, and it can accomplish some things that would not otherwise be possible. At the same time it can create its own problems and prove to be expensive.

A Look At Some Operating Systems . . .

Arizona State University, Hayden Library (Tempe, Arizona)[4]

This library, with a collection of over 70,000 sheets, began automation in January 1973. Unlike most systems, it is essentially an information retrieval system rather than a document retrieval system. The system is a modification of one used for the University's Southwest Environment Data Bank and, therefore, development costs were low. A descriptive rather than publisher's title is given as well as subjects, scale, date, language, and projection. There is no upper limit for subject information though most sheets would require no more than six headings.

The system provides a computer produced shelf list on card stock, a printout, and/or a COM (computer-output microform) fiche or film. The list is a KWIC/KWOC index. Once the descriptor parameters have been determined, indexing is rapid and up to 50 sheets/titles can be processed a day. Although the system has been in operation for only a few months, the map librarian reports that user response has been very favorable.

University of California (Santa Cruz, California)

The system in operation at the University of California was first proposed by Carlos Hagen for his collection at Los Angeles.[5] A single eighty column IBM card is used to record information, largely in code form. Maps are classified according to the Library of Congress G schedule and partial title is given. A numerical code of five digits is used for publisher, and codes are also used for form, language, projection, and location. An accession number is given to each sheet and this is used for recording circulation. Cards are punched and the catalog is a computer-produced printout. Each issue of the catalog gives a summary of the L.C. classification and an explanation of the codes.

Illinois State University (Normal, Illinois)

The Illinois State University system also utilizes the Library of Congress G schedule. Codes were developed for publishers, projection, language, etc., and the information recorded on three punched cards. A printout is produced, arranged by L.C. classification number with short or abbreviated title. Printouts are also planned for area, subject, sub-area, and publisher.

Laval University Library (Quebec, Canada)

CARTESS, the automated cataloging system and CARTOMATIQUE, a system for handling maps through microreproduction and an optical selector (Kodak's Miracode) have been in use at Laval since 1971. With CARTESS, 32 types of data are recorded and transferred to magnetic tape for computer use. Two printouts, one by area with subject, scale, dates, etc. and one by subject followed by area are produced although lists could be made by any data field. The two systems are in fact complementary sub-systems, one permitting bibliographic control, the other documents control.

McMaster University, Map Library (Hamilton, Ontario, Canada)

A computerized system was introduced at McMaster in 1966 and the original program remained unchanged until 1970. A unique hierarchical code was developed which places maps with related characteristics in proximity. As in the Santa Cruz system, an 80 column IBM card is used to record the information, which is in 13 fields. Considerable modifications were made in 1970 and the following data is now included: ID number, title (as it appears on the map), scale, metric indicator, type of scale (leagues, miles, etc.), area, date, two subjects, language, projection, height, relief, color, and format.

A code was also devised for the subjects. After 1½ years with 5,000 items cataloged, there were only 35 additions to the subject tables.

Simon Fraser University Library (Burnaby, British Columbia, Canada)

The Simon Fraser University program has been in operation with only slight modifications since 1968. Maps are classified using the Library of Congress G schedule. Information is entered on a coding sheet, key-punched, and put on tape. Classification,

projection, language, location, and form are coded; all except classification are printed out in full in the catalog listings. A classified (shelf list) and an alphabetical list by area are produced as well as one by subject. A map may be given up to six subject headings.
In 1973 a listing by historical periods was generated. Maps within each period are arranged alphabetically by area name.

U.S. Defense Mapping Agency Topographic Center (Washington, D.C.)

One of the pioneers in automation, the Defense Mapping Agency (formerly Army Map Service) began using punched cards in 1945. Following reorganization of the library in 1968 on the basis of function rather than type of material, work was started on an automated system that would analyze data from any form--books, maps, journals, documents, photographs. An optical character recognition system (OCR) is used to produce the input tape for the computer. A pilot test of 25,000 records for maps, books, and documents was done in 1972 and in January 1973 the system was fully implemented. The system produces catalog cards in filing order, accession lists, query responses, and statistical summaries. Accession lists are daily with cumulations every two weeks.

Records from approximately 120,000 maps and texts have now been added to the master file. It is estimated that it will take about four years to convert the entire collection of about 1,700,000 maps, 130,000 nonperiodical texts, and 50,000 periodical issues.*

U.S. Library of Congress, Geography and Map Division

The MARC II format already adopted for monographs is being implemented to catalog maps. The system is a document retrieval system to control single sheet maps with a relatively small staff.

The MARC II system for maps is compatible with standard Library of Congress procedures and the description and subject analysis is similar to manual cataloging. The Library of Congress G schedule is used and Anglo-American Cataloging Rules are followed for description and entry. The work sheet provides 14 fixed-field data elements such as date, publisher, projection, etc. Elements in variable fields include author, title, imprint. Author, subject, and shelf list catalog are produced in both card and book form. Accessions and authority lists, as well as printouts by area, subject, and date in various combinations can also be produced.

In the spring of 1973 MARC records on tape were made available to interested libraries on a monthly basis. The subscription service is $400 per year, but a map test tape containing approximately 200 records is available for $20

Notes

1 For a discussion of classified schemes see the articles in this issue by Mary Larsgaard p 37 and Ralph E Ehrenberg, p 49

2 See the article in this issue by Gail N Neddermeyer, *Map Cataloging* on p 27

3 Patricia A G Alonso, "Feasibility Study on Computer-Produced Map Catalogue" *The Australian Library Journal*, July 1972 pp 245-252

4 Elizabeth Al-Hazzam, Information received from the map librarian, Elizabeth Al-Hazzam, during the meeting of the Western Association of Map Libraries Ashland, Oregon, March 1973

5 C B Hagen, "An Information Retrieval System for Maps" *UNESCO Bulletin for Libraries*, January-February 1966 pp 30-35

6 Letter from Frank T Nicoletti Chief Department of Technical Services, Defense Mapping Agency, April 16 1973

The Administration of a Map Library

Carlos B. Hagen

The purpose of this article is to give a general administrative overview to those undertaking the formation and/or administration of a map library. Because of the number of emerging map libraries, my observations will be mostly about small and medium sized libraries. Most of my experience is in the development and administration of a large map library, but I will omit most specialized topics and concentrate on the overall administrative subjects of general concern that affect small as well as large map libraries.

From the time he assumes his responsibilities a map librarian is faced with a multitude of administrative decisions. Fortunately or unfortunately—depending upon your point of view—most have little to do with what the librarian has learned in library school. Such decisions cover an immense range of subjects from architectural specifications to design of office filing systems, from public relations to specifications for specialized equipment such as paper cutters, or designs for versatile keyboards for office typewriters.

On the whole an administrative job as a map librarian can be very fascinating, and very demanding, but can also be utterly frustrating and at times depressing.

Administrative Affiliation

In the academic environment at least, the two usual possibilities are for a map library to be a part of the library system or of an academic department, generally one of the earth sciences such as geography or geology. Both possibilities offer advantages and disadvantages.

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Affiliation with an academic department generally means that the faculty will have more extensive knowledge of the library materials and a good understanding of the library's needs. The negative aspects however can be numerous. Budgets generally are inadequate, especially in terms of personnel and the possibilities of hiring professional staff. Collection development and library policies are closely subordinate to the needs of the particular department without much consideration for the overall needs of the rest of the campus or the surrounding community. Moreover, service patterns usually are stronly biased toward the faculty and students of the academic department involved at the expense of a wider service pattern that considers the needs of the community at large.

Affiliation with a library system generally means steadier and more balanced budgets in the long run besides the assurance that eventually the library most surely will be staffed by employees at the professional level. Collection development and service patterns generally are geared to serve the entire campus and surrounding community uniformly. On the negative side, a map librarian may often find quite a lack of understanding and sympathy from high level administrators who still, in many systems, regard maps as sort of low priority, second class library materials. Moreover, efforts to collect complementary map materials (i.e. atlases, travel guides, periodicals, reference books, etc.) can often cause friction with other library sections or departments.

In the long range, I am inclined to advise affiliation with the library system although the gap of understanding, indifference, or lack of sympathy that often develops from the library administration toward the needs of the map library can become a major source of frustration. This is an area where a map librarian has to become an efficient public relations person and "sell" his library and services to the administration, a task that often requires great skill, patience, and perseverance.

Size, Scope, Services, and Collection Development

One of the first overall administrative tasks for map librarians is to determine the eventual size, scope and services of the map library, which in turn will determine the acquisition policies of the library. Such a determination should not be a rigid one. It should have some flexibility, and the basis for decision should be subject to evaluation at least on a yearly basis, taking into consideration

service patterns, users' demands, and changes in the community served. There are two important questions in this regard that I would like to touch on briefly:

Should the map library be only a map room or also collect complementary materials (i.e. atlases, aerial photographs, periodicals, reference books, clippings, etc.)? Personally, I do not favor the artificial concept of a map room based on the traditional and arbitrary division by the format of the materials. I advocate the concept of a dynamic centralized cartographic information center that supplements the core collection of maps with some of the materials mentioned above.[2] This concept can easily cause conflicts and frictions with other library departments or sections within a library system; still another area where the administrator must exercise great qualities of skill, patience, and public relations.

Should the map library collect rare and historical maps? I mention this because such materials have high status, are highly respected and liked, and any map library administrator will, sooner or later, face some influential pressures to collect them at the expense of more routine and contemporary materials. However, such rare and historical maps are extremely expensive and, despite their high status and attractiveness, often serve a very small though select and influential clientele. A decision is generally very difficult and demands great will power, diplomacy, and a very clear mind, coupled with foresight and a sense of balance and values.

Physical Facilities

Most library administrators have little or no contact with architects or engineers. However, a map library presents a number of very unusual requirements of space and location. Just to mention one engineering and architectural specification of crucial importance, the steel storage cases for maps combined with the maps they hold are so heavy that structural considerations make it almost mandatory that a map library should be located on a ground floor. Moreover, banks of ceiling lights should be coordinated according to the location of the cases which, due to their massive proportions and weight, become almost permanent. Some years ago I prepared a report for the library system of the University of California, Santa Cruz in which I discussed in some detail a number of administrative decisions concerning the physical setting and facilities of a map library.

Personnel

A crucial administrative decision that must be made early, especially in terms of projected budgets, is whether the library will eventually be staffed by professional or non-professional staff. By professional, I mean persons with degrees in subjects such as cartography, geography, engineering, and especially library science. Non-professional staff are persons without such degrees or casual part time employees such as student assistants. Of course, an important consideration is budget, because the rates for professional staff are generally more than twice as much as those for non-professionals. Another consideration, the importance of which I cannot over emphasize, is permanency of the personnel. A map library, especially as it grows larger, offers many unusual and complex problems and situations that are not taught in any school but must be learned on the job. It generally takes many months to train an employee of a map library well, and to lose that person after a short time represents a loss which can be far more serious than a similar loss in other more traditional library services or departments

As a rule of thumb, the larger and more complex a map library becomes, the greater the need it has for competent professional staff. This is why, despite the higher cost, I strongly advocate the use of some professionals, even in smaller operations, and especially so in this age of information retrieval, automation, and information explosion

Acquisitions

This is of course a subject closely related to other administrative decisions such as affiliation, size, scope, and services. One of the first administrative tasks of a map librarian should be the preparation of an acquisitions and collection development policy. This should not be a rigid policy but a flexible one that could be subject to yearly evaluation. It also should be highly responsive to the changing needs of the community served. This is of course a highly individual matter for each institution, but for an overall view there are a couple of articles that could be recommended for persons preparing some general guidelines on this important matter.[1]

Budget Preparation

The preparation of a map library budget can be a very taxing and confusing task when first initiated, and especially if there are no

other frames of reference available. This is another very individual subject that may vary greatly from institution to institution. However, in an effort to present at least a basic framework, I present now what I consider to be the minimum budgets for the orderly development of a small and a medium sized map library.

Projected Expenditures for a Small Size Map Library

(Goal of 20,000-25,000 maps in a five year period)

one year		five years	
Acquisitions budget			
Basic allocation	**$4,000**		**$20,000**
Personnel budget			
		(5% yearly increments)	
One L-1	9,000		
LA 111	3,900	Year 1	28,200
Two student		Year 2	29,600
assistants LA-1	11,600	Year 3	31,100
	24,500	Year 4	32,700
Hidden costs (15%)*	3,700	Year 5	34,300
Total	**$28,200**	**Total 5-yr. per.:**	**$155,900**
Equipment and Furniture budget			
Map cases (rate of 1,000 maps 5 drawer unit)	1,000		
Other shelving	500		
Map folders	500		
Specialized equipment	500		
Mail and telephone	1,000		
Office equipment	300		
Secretarial supplies	200		
Total	**$4,000**	**Total 5-yr. per.:**	**$20,000**
		Projected Cost for a 5 yr. period	**$196,000**

* Labor performed by personnel from the general library system (such as cataloging of book materials, processing of invoices, issuance of payment checks for purchases, processing of payroll, and various administrative duties, etc.

Projected Expenditures for a Medium Size Map Library

(Goal of 50,000-75,000 maps in a five year period)

one year		five years	
Acquisitions budget			
Basic allocation	**$8,000**		**$40,000**
Personnel budget			
One L-111	11,000	(5% yearly increments)	
Two L-11	20,200	Year 1	55,600
Three student assistants LA-1	17,200	Year 2	58,400
	48,400	Year 3	61,300
Hidden costs (15%)*	7,200	Year 4	64,400
		Year 5	67,600
Total	**$55,600**	**Total 5-yr. per:**	**$307,300**
Equipment and Furniture budget			
Map cases (rate of 1,000 maps 5-drawer unit)	2,000		
Other shelving	1,000		
Map folders	1,000		
Specialized equipment	1,000		
Mail and telephone	1,200		
Office equipment	500		
Secretarial supplies	300		
Total	**$7,000**		
		Total 5-yr. per.:	**$35,000**
		Projected cost for a 5-yr. period	**$382,000**

* Labor performed by personnel from the general library system (such as cataloging of book materials, processing of invoices, issuance of payment checks for purchases, processing of payroll, and various administrative duties, etc.)

Technical Processing

Perhaps the most important administrative decision in this area is whether the collection will be cataloged or simply classified. Cataloging a map, like cataloging a book, implies extracting a number of identifying elements of the map and writing them down on a variable number of catalog cards. On the other hand,

classification is a much simpler process that entails simply assigning the map a call number by area, subject, scale, etc. and filing it away.

Cataloging is of course the ideal solution and especially so when it is combined with automation techniques. The map library is then able to produce frequent and up to date computer printouts arranged conveniently by area, publisher, subject, scale, or any other identifying element for maps.

In the last few years virtually dozens of articles about possible automation in the map library have appeared. But the basic fact still remains the same; namely, before the data is entered on to computer tapes, someone must manually process every single map. Even if the process is done with very simplified cataloging (using form sheets with spaces for checkmarks) and with the relatively inexpensive labor of student assistants, it may require several thousands of man hours of labor to properly catalog even a small collection.

Given the low priority that is generally assigned to maps in library systems, the basic practical rule that an administrator must remember is that the larger the collection the more difficult the task of cataloging and therefore the greater the difficulty of eventually preparing an automated catalog in the form of computer printouts. Smaller collections (of something up to about 10,000 maps) have much greater chances of successfully undertaking such a project, because it means less work. For a larger map collection a partial solution might be to catalog only part of it, for example, the most frequently used portion, or only the new incoming materials. The latter solution is the one attempted by the Library of Congress for the well known MARC tapes. Several years ago, I proposed a system of automated data processing for a map library.[5] Up to the present it has not been possible to implement such a system at the UCLA Map Library due to its large size. However, this proposal was used as a basis for an automated catalog at the Map Library of the University of California at Santa Cruz which at that time had only about 5,000 maps. Now, with more than twice that amount the system is still in operation and extremely successful.

Whether or not the collection is cataloged, the administrator must choose a system of classification for its holdings. This is another crucial decision that once taken is very difficult to reverse. In map library literature there are a number of excellent articles published giving comparisons and evaluations of various systems of map

classification. I am inclined to recommend the Library of Congress system of classification especially in view of the nation-wide distribution of the MARC tapes and the fact that the LC system is rapidly becoming a sort of standard in the library field. At the UCLA Map Library we have a number of reservations about the LC system, and we have had to introduce a number of revisions, but on the whole it can be said that it is a fairly satisfactory system that can be used by large as well as small map libraries. Classification is discussed in depth in this publication by Mary Larsgaard and Ralph Ehrenberg.

Files

One of the first and most crucial tasks for an administrator is to establish the basis of a good filing system, something that must be done with plenty of foresight and room for expansion. If this is not done, and especially if the library operates with part-time employees subject to frequent turnover, the result in a few years can be absolute chaos. For regular office files, there a number of filing equipment companies that distribute booklets as a public service. These give some general advice as to file organization. However, for the map library, the administrator must design systems geared to more specialized needs.

At the UCLA Map Library, besides a number of specialized files (map indexes, equipment, etc.), our two major files are the office files and the map information files. A system that I am inclined to recommend for general office files is a decimal system similar to the Dewey. For example, personnel may be assigned the general number 100 and sub-divisions within that category (e.g. payroll, employment applications, time sheets, etc.) may be assigned numbers ending in tens, sub-divisions of those subjects may be assigned numbers ending in units, and from then on decimal sub-divisions can be added as the need arises. Our map information files are geared mostly to our acquisitions program. The material in these files is divided alphabetically by countries and within each country by agencies and dealers. Within each one of these divisions the material is further sub-divided into three kinds of folders: a) folders containing invoices, statements, and other such accounting materials; b) folders containing only correspondence; c) folders containing only catalogs, price lists, promotional material and such.

Finally, I would like to recommend that an equipment file be established from the beginning. As mentioned earlier, most of the

equipment in the map library is fairly specialized, and often is produced by small concerns, or one-man companies, whose advertisements may only be found buried in the pages of large catalogs. To collect all such material in a centralized file arranged by types of equipment can save an immense amount of labor and greatly expedite the purchase of specialized equipment

Professional Affiliations

Even if the map library is small, I strongly recommend affiliation with several map library associations. The bulletins, proceedings, directories, and other materials published frequently by these associations contain a wealth of specialized articles and reports that can be of immense help to the administrator of a map library regardless of its size, scope, or aims. The three very active associations that I strongly recommend are the Geography and Map Division of the Special Libraries Association, the Western Association of Map Libraries, and the Association of Canadian Map Libraries

Finally, I would like to recommend to any administrator of a map library not to lose contact with the materials of his library. Often, the pressures of administrative work and the demands of duties relating to budget preparation, administrative reports, meetings, public relations efforts, etc. are such that, almost unnoticed, the administrator may find that he is losing touch with the actual handling, processing, and reference work with maps. I especially believe that acquisitions and reference work with maps are of the utmost importance. My recommendation to any administrator is never allocate less than 25% of his time to keeping abreast of the fast changing world map publishing and the changing public demands on a map library

Notes

1 Some very useful hints in this regard can be found in John G. Fetros [illegible] to Win Administrative Support for a Map Collection," *Western [illegible] Map Libraries Information Bulletin*, May 1971, pp. 14-20.

2 A [illegible] example of this concept is the UCLA Map Library which is [illegible] a cartographic information center made up of an ensemble of [illegible] collections, subcollections, of cartographic materials. For a [illegible] of the library see Carlos B. Hagen, "The UCLA Map Library," *Bulletin, Special Libraries Association Geography and Map Division*, No. 39 (December 1962), 6-10.

3 Carlos B Hagen, *The Establishment of a University Map Library* (Los Angeles: University of California, 1965), 17 pp plus supplements Most of the pertinent portions of this report were reprinted in *Western Association of Map Libraries Information Bulletin*, October 1971 pp 2-15

4 Maureen Wilson, "The Acquisitions Policy of the University of British Columbia Map Library," *Proceedings of the First National Conference on Canadian Map Libraries, June 14-16, 1967* (Ottawa Public Archives of Canada, 1967), pp 9-15 The text of Miss Wilson's paper is followed by a transcript of a very interesting discussion on the subject that ensued at that conference after she presented her report

Alberta Koerner, "Acquisition Philosophy and Cataloging Priorities for University Map Libraries," *Special Libraries*, Nov 1972, pp 511-516

5 Carlos B Hagen, *An Information Retrieval System for Maps* (Los Angeles University of California, 1964, revised January 1967) The most pertinent parts of this report were reprinted in the *UNESCO Bulletin for Libraries* 20, no 1 (January-February 1966) 30-35

6 Some excellent ideas on filing systems for map acquisitions can be found in "The Control of Map Acquisitions Panel II, Spring 1970 Meeting of the Western Association of Map Libraries" *Western Association of Map Libraries Information Bulletin*, June 1970, pp 26-31

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Stanley D. Stevens, in addition to his position as map librarian at the University Library, University of California, is in charge of the recordings and slides collections. He was assigned the task of formulating a map collection in 1965, the year the Santa Cruz Campus was opened. In 1966 when a West Coast group for map librarians was proposed, he was Chairman of the formulating Executive Committee. Upon the formal founding (July 1, 1967) of the Western Association of Map Libraries, he was elected President. He has since served as Treasurer, and Editor of its *Information Bulletin* which appears three times a year.

David A. Cobb holds a BA in history with a minor in geography from the University of Vermont. He holds an MA in geography from this same institution. Currently he is completing an MLS degree in the Graduate Library School at Indiana University. He has been map librarian at the University of Vermont and at Indiana University. During the summers of 1968, 1969 and 1971 he worked in the Geography and Map Division of the Library of Congress. He is currently associate editor of the SLA Geography and Map Division *Bulletin*.

Gail Nichols Neddermeyer received an AB from Smith College in 1968 and an MSLS from the University of Southern California in 1969. She began work at University of California at Riverside after finishing library school, and has been head of the Government Publications Department since August 1972. It includes documents, maps, and law materials. She is active in several professional organizations which concern themselves with documents and maps.

Mary Larsgaard received a BA with a major in geology from Macalester in 1968. Her MSLS degree was granted in 1969 from the University of Minnesota. Since then, she has been employed at Central Washington State College in the Victor J. Bouillon Library, as map librarian. She belongs to several professional organizations including the Western Association of Map Libraries and has authored several articles in professional journals.

Ralph E. Ehrenberg received his BA and MA from the University of Minnesota after service in the United States Navy as an aerial photographer. Following graduation he worked for two years as a cartographer for the Aeronautical Chart and Information Center in St. Louis before joining the National Archives in 1966. He served as co-director of the 1971 Conference on the National Archives and Research in Historial Geography and is currently editing the proceedings of that conference. A recipient of a 1972-73 Council on Library Resources Fellowship, he has visited a number of archives and libraries in the United States, Canada, and England during the past year.

Marie T. Capps earned a BA in Education from Central Washington State College in Ellensburg, Washington in 1948 and an MSLS from the State University of New York at Albany in 1968. She is currently the map and manuscript librarian at the United States Military Academy Library, West Point, New York.

B. F. Phillips received a BA from the University of British Columbia in 1953 and a BLS from the University of Toronto the following year. He has worked as a reference librarian in both university and public library settings, in the latter in the history and sociology division where his responsibilities included the map collection. In 1965 he became head of the Social Sciences Division of the newly created Simon Frazer University at Burnaby, British Columbia. Under his direction a map collection was developed (currently 45,000 sheets) and a separate position of map curator was created. He developed one of the first computerized map catalogs in North America.

Carlos B. Hagen has been in charge of the UCLA Map Library - one of the largest map libraries in western U.S. - for the last ten years. He is also Audio-Visual Consultant for the UCLA Library and has degrees in engineering, geography, and library science. He has written a number of articles in map librarianship, cartography, information retrieval, and sound recordings.

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